

Panamá and the Panama Canal



A GLIMPSE OF THE EARLY HISTORY OF THE ISTHMUS— FORMER CANAL SCHEMES.

As the matters discussed in this book may give rise to a great deal of criticism, I think it well to anticipate my chapter on the Panama Canal by giving, at this point, a brief resumé of such work on the Isthmus from the earliest times. I take this precaution simply to throw safeguards around the statements of facts that will be found in this volume. In citing from the various authorities it is possible that in one or two places there may be a slight repetition, but the consensus of the whole will be in perfect harmony with my treatment of the question.

“The Isthmus of Panama is that portion of the narrow ridge of mountainous country connecting Central and South America, which is bounded on the west by the frontier of Costa Rica, and on the east by the surveyed interoceanic route from the Bay of Caledonia on the north, to the Gulf of San Miguel on the south or Pacific side.

“The State of Panama contains the provinces of Panama, Azuero, Chiriqui and Veraguas. The Isthmus throughout is traversed by a chain of mountains. The highest peak is Pichaco, 7,200 feet high, in the west. The area of the State of Panama is 29,756 square miles; population, 220,542. . . . There are many rivers in the State, and they fall into both oceans. The climate is unhealthy, except in the interior and on the flanks of the mountains. . . . The summit of the railway is 250 feet above the level of the sea, and its average amount of goods traffic yearly is 60,000 tons, realizing £11,000,000 sterling. . . . Panama is chiefly important, however, as

the Pacific terminus of the Panama railway. Population of Panama City 18,390. The former city of Panama, the seat of the Spanish colonial government, established in 1518, stood six miles northeast of the port of Panama. It is now a heap of ruins." *

According to the authority just cited, the traffic realizes £11,000,000, or over fifty millions of dollars. The error is manifest. It is estimated that the value of goods passing over the railroad is some fifty millions of dollars per annum. The traffic receipts of the Panama Railroad, as I have stated elsewhere, are anywhere from two to a trifle over three millions of dollars.

I have already dwelt upon the number of islands in the Gulf of Panama. Some of these possess great value if considered from a strategic standpoint. During my residence on the Isthmus, time and again officers from the foreign men-of-war have made surveys in the gulf, with a view of ascertaining the depth of water around some of the important islands. I was told by the proprietor of one important island in the gulf that some delicate *pour parleurs* had been made on behalf of a continental government, with a view of transferring an important island to that power, really to be used as a coaling station, the sale to be made to a private individual, who would act for his government. The power referred to was neither American, English or French.

"Beyond the peninsula of Azuero the coast of the Isthmus is broken by the Bay of Montijo, which contains several islands. The largest of these, Coiba, has an area of 180 square miles and contains the port of Damas." † I think it well to refer specifically to this island for a variety of reasons. It is one of the largest islands in the Pacific, well watered, rich in woods, and affording excellent anchorage close in shore. ‡

By consulting the authority that I have referred to here much valuable and instructive information will be

* Chambers's Encyclopædia, Vol. VII. ed. 1868.

† The American Cyclopædia, Vol. XIII. ed. 1879.

‡ The "Pacific Pilot," Imrie, London.

obtained regarding this island. A few years ago, before the government of Colombia made its first transfer of land to the Canal Company, a commission visited that island. It was sent out by the Canal Company from France; and its chief was M. Harel, a brother-in-law of Count Ferdinand de Lesseps. Among many others in the commission, was Lieutenant Lalanne and Dr. Chambon of the French navy. It would seem that they had been sent to the Isthmus on a species of secret commission to locate lands, but really with a view of securing the large and important island of Coiba.

Secrets, when in many hands, are like water in a sieve—likely to be lost. At a dinner given at the house of the then Superior Agent of the Canal Company, the plan was discussed—and the idea of securing Coiba as a *point d'appui* for M. de Lesseps' company, of establishing thereon a French colony, was fully talked over. M. de Lesseps' commission, instead of maintaining rigid silence, talked. Within four and twenty hours a newspaper letter was written for *The Gazette* (Montreal) and a cablegram sent to the Associated Press in New York. The letter to the Montreal paper was mine; the cablegram to the Associated Press was from its agent there. M. de Lesseps denied the matter inside of six and twenty hours. He seems to live in a perfect atmosphere of contradictions and reiterations. Despite the fact that he had no ulterior purposes to serve, that commission, fully equipped, paid a visit to the Island of Coiba. From there they proceeded to the department of Chiriqui, and, after an absence of weeks, returned to the Isthmus, and thence to France, to submit their report to the Canal Company. The correspondents who furnished the information to the world were not decorated. Despite M. de Lesseps' statement, his company tried to secure the island as a part of the concession, but the scheme aborted, owing to the fact that certain Colombians had proprietary rights there. I have skirted the shores of Coiba, and it is a large, attractive island, well wooded, the highest point, writing from memory, being some two hundred and odd feet. It is an island that could be used

in the most effective way by any power, if the Panama Canal ever becomes a fact.

"In 1698 William Patterson founded a Scotch colony at Puerto Escoces (Scotch Port) in Caledonia Bay."

As stated "Panama was founded in 1518 by Pedrarias Davila" about six miles northeast of the present site, "to which it was transferred after the destruction of the old site by the buccaneers in 1670. It has suffered much from disastrous fires: in 1737, when it was almost entirely destroyed, and 1864, 1870 and 1874, the losses for the last year amounting to \$1,000,000." *

"Panama has a large commerce, but most of it is due to the transit trade."

The Isthmus of Panama has derived its chief importance from its supposed facilities for the construction of an interoceanic canal. Since 1528 the idea has been mooted of opening a canal between the river Chagres (falling into the Caribbean Sea at the town of the same name. The Chagres which falls into the Caribbean a little west of Limon Bay, is navigable for bungaloes for about thirty miles) and the Grande, falling into the Pacific near Panama, or the Trinidad and Camito.

"The route was examined by two Flemish engineers under the orders of Philip II., but for political reasons the king ordered that no one should revive the subject under the penalty of death." †

Canals seem to have been as dangerous themes to handle in those days as in ours, but it is a trifle startling to find that the penalty of death hung over a man who gave the subject of canalization publicity. Associations for the advancement of science certainly were not popular under the rule of that iron-handed king.

"The Isthmus, in a wide sense of the word, forms a State, one of the United States of Colombia, extending from the frontier of Costa Rica to that of the State of Cauca and containing six departments—Coclé, Colon,

* The American Cyclopædia, Vol. XIII. 1879. See also "History of Isthmus of Panama," Seemann, Panama.

† Ibidem.

Chiriqui, Los Santos, Panama and Veraguas. Population of State 285,000. Population of Panama City 18,378, mostly negroes or mulattoes. The Isthmus of Panama was formerly called the Isthmus of Darien."*

A standard authority thus describes modern Panama: "In the sixteenth and seventeenth centuries Panama was, next to Carthagena, the strongest fortress in South America, but its massive granite ramparts, constructed by Alfonzo Mercado de Villacorte (1673), in some places 40 feet high and 60 feet broad, were razed on the land side (where they separated the city proper from the suburbs of Santa Ana, Pueblo, Neuvo, and Arrabal) and allowed to fall into a ruinous condition towards the sea. The Cathedral, built in 1760, is a spacious edifice, in the so-called Jesuit style, and its two lateral towers are the loftiest in Central America. It was restored in 1873-6, but the façade was destroyed and columns thrown down by the earthquake of September 7, 1882.

"In the rainy season streams of water flow down the streets, but in the dry season the city is dependent on water brought in carts from Matasnillo, a distance of several miles, the only perennial wells which it possessed having been dried by the earthquakes of March, 1883. Besides the Episcopal Seminary there exists a Sisters of Charity School and Ladies College, with teachers from the United States and Canada.

"In 1870 the population of Panama City (of a very varied origin) was 18,378; by 1880 it was 25,000, of whom about 5,000 were strangers.

"Panama (an Indian word, meaning abounding in fish) was founded in 1518 by Pedrarias Davila, and is the oldest European city in America, the older settlement at Santa Maria el Antigua near the Atrato having been abandoned and leaving no trace. Originally it was situated six or seven miles farther north on the left side of the Rio Algarrobo; but the former city, which was the great emporium for the gold and silver of Peru, and 'had eight monasteries, a cathedral and two churches, a

* Johnson's Universal Cyclopædia, Vol. VI. New York, 1887.

fine hospital, two hundred richly furnished houses, nearly five thousand of a humbler sort, a Genoese Chamber of Commerce, and two hundred warehouses, was after three weeks of rapine and murder, burned February 24, 1671, by Morgan's Buccaneers, who carried off one hundred and seventy-five loaded mules and more than six hundred prisoners.' (See 'Travels of Pedro de Cieza de Leon,' Hakluyt Society, 1864.) A new city was founded on the present site by Villacorte in 1673 Population State of Panama, 1870, was 221,052.

"A proposal to pierce the Isthmus of Darien was made as early as 1520 by Angel Saavedra. Cortez caused the Isthmus of Tehuantepec to be surveyed for the construction of a canal; and in 1550 Antonio Galvão suggested four different routes for such a scheme, one of them being across the Isthmus of Panama. In 1814 the Spanish Cortes ordered the Viceroy of New Spain to undertake the piercing of the Isthmus of Tehuantepec; but the War of Independence intervened, and, though a survey was made by General Obegoso in 1821 and José de Garny obtained a concession for a canal in 1842, nothing was accomplished. Bolivar, a president of Colombia, caused Messrs. Lloyd and Falmarc to study the Isthmus of Panama. Lloyd, whose paper was published in the 'Philosophical Transactions,' London, 1830, proposed to make only a railway from Panama to Chorrera to the Rio Trinidad (tributary of the Chagres), and to establish a port on the Bay of Limon. M. Napoleon Garella, sent out by the French government in 1843, advocated the construction of a sluiced canal. An American company, stimulated by the sudden increase of traffic across the Isthmus, caused by the discovery of gold in California, commenced in 1849 to construct a railway, and their engineers, Totten, and Trautwine, already known in connection with the canal (El Dique) from Carthagená to the Magdalena, managed, in spite of the extreme difficulty of procuring labor, to complete the work in January, 1855. Meanwhile the question of an inter-oceanic canal was not lost sight of; and in 1875 it came up for discussion in the *Congrès des Sciences Geograph-*

iques at Paris. A society under the control of General Türr was formed for prosecuting the necessary explorations; and Lieutenant Wyse, assisted by Celler, A. Reclus Bixio, etc., was sent out to the Isthmus in 1876. In 1878, the Colombian government granted the society known as the Civil International Interoceanic Canal Society, the exclusive privilege of constructing a canal between the two oceans through the Colombian territory; but at the same time the ports and canal were neutralized. In 1879, M. de Lesseps took the matter up, and the first meeting of his company was held in 1881. The capital necessary for the 'Company of the Interoceanic Canal of Panama,' as it is called, was stated at 600,000,000 francs, the estimated cost of excavation being 430,000,000, that of the trenches and weirs to take fresh water to the sea, 46,000,000, and that of the dock and tide gates on the Pacific side, 36,000,000. The Panama Canal (railway?) was bought for \$20,000,000. The contractors, Couvreux and Hersent, began operations in October of the same year. Meanwhile the United States government proposed to make a treaty with Colombia by which it was to be free to establish forts, arsenals and naval stations on the Isthmus of Panama, though no forces were to be maintained during peace. But the British government objected to any such arrangement."*

I wish to call attention anew to General Türr's society, formed, following the *Congrès de Science Géographiques*, for prosecuting the necessary explorations, and to the fact that his brother-in-law, Lieut. Lucien Napoleon Bonaparte Wyse, took command of that expedition. The latter, in 1886, issued a book in Paris under the title of *Le Canal de Panama*. It is a voluminous tome, bound in half leather and gilt. I have a copy by me. Lieut. Lucien Napoleon Bonaparte Wyse, in a very lengthy preface, states his grievance, which is largely as follows: He it was who made the remarkable survey that has been described in Lieutenant Sullivan's book;† a

* *Encyclopædia Britannica*, Vol. XVIII. ed. 1885.

† "Problem of Interoceanic Communication," etc., Washington.

survey made for about two-thirds the distance across the Isthmus and projecting beyond that point, by some occult procedure unknown to the vulgar. This fact, however, in no wise interfered with his making an estimate of the value of the canal, even to within ten per cent. of its cost! Lieutenant Wyse in the preface, does not seek for himself any glory on this terrestrial globe, but he does feel that it is due his children that their father's name should be associated with that great enterprise. As Lieut. Lucien Napoleon Bonaparte Wyse's book has appeared simply in French, and not in English, it affords me great pleasure to add my little share in allotting to him all the credit that is due him. Personally, I shouldn't have the slightest ambition to have my name connected with an enterprise of that sort, one that will result in the most hopeless sort of failure ever known.

In the body of his book Lieut. Lucien Napoleon Bonaparte Wyse deems the work on the canal of an extravagant nature, and in the lamest way possible explains his connection with certain things financial. The reader must never lose sight of the fact, that the Lieutenant went out to the Isthmus in command of the first expedition, to which I have referred. He was sent out to make that survey *de novo*. At that packed Congress in Paris in 1879 his plan was to be adopted—and it was adopted. Subsequently the concession was sold to the Canal Company for ten millions of francs, or two millions of dollars. Perhaps it has not occurred to Lieut. Lucien Napoleon Bonaparte Wyse that his surveys, which, according to the late Admiral Bedford, F. C. Pim, R.N., failed to excite universal admiration, were in themselves the first, of many steps in the dark made by the Panama Canal Company.

There is another, and to me exceedingly instructive fact in connection with the founders' shares in the Canal Company. It is generally the custom, when people receive benefactions in the shape of founders' shares—which cost them nothing but the effort of writing a polite note and thanking the company for them—if they

are bonanzas, to hold them. They, by the way, wouldn't be bad things to leave to one's children. Since 1884 the Panama Canal Company have known the canal practically was impossible; but with a feeling of brotherly love, and with the idea of benefitting others by the sale to them of that which cost the venders nothing, they broke their founders' shares up into sections and placed them upon the Paris Bourse. An unsuspecting public, to use a homely phrase, caught them up "like hot cakes," and thus the founders of this "great and disinterested work of civilization" netted some millions of dollars. In the near future the holders of fractions of the founders' shares will have the peculiar consolation of knowing that they hold the shares and likewise the experience, and the founders hold their cash. Perhaps Lieut. Lucien Napoleon Bonaparte Wyse, when he writes a new book on the Panama Canal, will be good enough to explain the wherefore of this.

In speaking of Panama, Whittaker states that "the prosperity of the State depends very largely upon its favorable geographical position, which facilitates transit from the Atlantic to the Pacific. The distance from Limon Bay to Panama on the latter is only thirty-five miles, and the highest elevation of the water-shed does not exceed 278 feet. A railway has joined the two oceans since 1855, and a ship canal is under construction since 1881, by a French company founded by F. de Lesseps. The canal will have a total length of forty-seven miles, an average depth of twenty-eight feet, a minimum width of seventy-two feet. Huge flood gates are required to regulate the tides, for while Colon, on the Atlantic, has a tide of only two feet; Panama, on the Pacific, has one of twenty feet. Up to the middle of 1885, eighteen million cubic yards of earth and rock had been removed out of an estimated total of one hundred and fifty-seven millions. M. de Lesseps, who inspected the works in 1886, accompanied by M. Rosseau, a government engineer, confidently announced the opening of the ship canal in 1892; he now says 1890. The cost, in 1879, was estimated at £41,700,000; and M. de Lesseps

asserts that the actual cost will not exceed £49,000,000. Twenty thousand men are employed upon this great work."*

In the above there are two errors. The distance from Limon Bay to Panama is given at thirty-five miles; it is more nearly forty-five. That "the highest elevation of the water-shed does not exceed 278 feet," is wrong. The lowest pass found in the hills by Colonel Totten was 238 feet, six inches, being that of the Panama Railroad at Culebra. There are hills in that vicinity towering hundreds of feet above the railroad. The crest of the hill adjoining the railway, on the left as you go to Panama, and just beyond the canal cut at Culebra, is some 500 feet above sea level.

Another authority† summarizes all the news down to January, 1888, when M. de Lesseps failed to obtain permission for his lottery loan. Hazell dwells upon the oft reiterated promises of M. de Lesseps to have the canal done and the contradiction of his forecasts by subsequent demands for more money.

"As far as I am concerned, I am firmly convinced that the construction of the canal at tide-level, according to the plans of M. de Lesseps for the Isthmus of Panama, is chimerical, if not absolutely impossible. Under any circumstances, if the canal ever becomes a reality, the enterprise itself as a source of profit will be nil."‡

In the fall of 1885, a work appeared, giving a great deal of information regarding the Panama Canal.§

"Across the Isthmus of Panama occurs, next to Nicaragua, the greatest depression yet found on the Isthmus, the summit level of the railroad being 287 feet above sea level. The route from Porto Bello or Chagres to Old or New Panama has been the established line of

* Whittaker's Almanac, London, 1888.

† Hazell's Encyclopædia, London.

‡ "Aperçu de Quelques Difficultés à Vaincre dans la Construction du Canal de Panama;" Paris, 1887.

§ "The Panama Canal;" Rodrigues, New York.

communication since 1653, nearly coeval with the first settlement in America. A survey was made in 1843 by the French engineer M. Garella *ingénieur-en-chef des mines*, of which an account is given in the document referred to, and of which the report was printed in the 'Journal of the Franklin Institute;' also in the French *Journal des Ponts et Chaussées* (1844). Mr. G. M. Totten, chief engineer of the Panama Railroad, subsequently made an estimate for a canal with locks, to cost from \$60,000,000 to \$115,000,000, according to the summit level adopted. The survey was renewed by the United States government, by Commander E. P. Lull, U. S. N., resulting in the location of a practicable line for an interoceanic ship-canal, twenty-six feet deep, from the Bay of Aspinwall on the Carribean Sea, to Panama on the Pacific.

"In 1879, Count Ferdinand de Lesseps made an appeal to the several nations to send delegates to a proposed congress to meet in Paris, to decide upon the route and the plan for an interoceanic canal between the Atlantic and Pacific Oceans through the American Isthmus. On May 15th of that year the congress met in Paris. The following countries were represented: Germany, England, Austria, Hungary, Belgium, China, Costa Rica, Spain, United States, United States of Colombia, Guatemala, Hawaii, Holland, Italy, Mexico, Nicaragua, Portugal, Norway, Russia, San Salvador, Sweden, Switzerland, France and the colonies of Algiers and Martinique. M. de Lesseps was elected president. The meetings of this congress continued from the 15th to the 29th of May. The congress was divided into commissions to investigate the several objects connected with the canal question, and information was furnished them by the several countries represented. On the last day of the meetings the following resolution was adopted by a vote of seventy-eight out of ninety-eight delegates: 'Congress believes that the cutting of an interoceanic canal, with a constant level, so desirable for the interests of commerce and navigation, is possible, and that this maritime canal, to meet the indispensable facilities

of access and utility which a passage of this kind should offer before all, shall be by way of Limon Bay to Panama.' The principal reasons for this decision are as follows, as given by Mr. F. M. Kelley in the *Indicator* (May 23, 1883): 'First, with the exception of the San Blas route, it is the shortest, being but forty-six miles long; second, it is the only feasible sea-level route without a tunnel; third, it has harbors at both termini, requiring but little or no improvements, easily reached on a wide, open sea; fourth, it has the Panama Railroad close at hand to deliver laborers, machinery, tools, and supplies of all kinds along the line where needed, at the lowest possible expense and in the quickest possible time; fifth, towed at the rate of five miles per hour, ships could pass through the Isthmus at Panama in ten hours, while at Nicaragua it would take about forty-five hours; sixth, for quickness and safety in passing the largest class of steam and sailing vessels, and the very much less cost of yearly maintenance, the Panama canal presents decided advantages over any long canal encumbered with numerous locks and artificial harbors, so liable to be destroyed by the floods and earthquakes of that country.

"Immediately after the adjournment of the congress a company was formed for building the canal—the Universal Interoceanic Canal Company, which was organized under the French law for the formation of corporations and co-partnerships, passed in July 24, 1867. According to this law, M. de Lesseps entered articles of incorporation and by-laws before notaries public, in Paris on the 20th of October of that year, which are now in existence and regulate the affairs of the company. These articles of incorporation are also in accordance with the requirements of the law of concession of May 18, 1878, granting certain privileges for the opening of an interoceanic canal through the Isthmus of Panama, as sanctioned by the government of the United States of Colombia. This concession was granted to Lieut. Lucien N. B. Wyse, as the representative of the 'International Civil Society of the Interoceanic Canal,' who

sold their rights and privileges to M. de Lesseps. Up to September, 1884, four subscriptions had been put upon the market, amounting to 536,350,000 francs, (\$107,270,000). The Canal Company bought the control of the Panama Railroad for \$17,000,000.

"The following general description of the canal is from a paper read before the Franklin Institute, October 22, 1884, by Charles Colné, secretary of the canal committee in New York: 'The canal commences at Colon (Aspinwall), running up to Gatun and to Dos Hermanos, in a very long curve, almost a straight line, starting at the sea-level in low lands, reaching Dos Hermanos, with an elevation of land to 20 feet in the gradual ascent, at a distance of nine and two-thirds miles from Colon. From Dos Hermanos to Frijole, a distance of seventeen and one-third miles from its mouth, the canal reaches the latter point at an elevation of 40 feet, with the exception of a hill between Bohio Soldado and Buena Vista, reaching a height of 165 feet. From Frijole to Mamei, a distance of twenty-four miles from the mouth, the line makes a bend, and reaches Mamei, with an average elevation of 50 feet, with intervening hills reaching to heights of 85, 100 and 118 feet. From Mamei to Matachin, twenty-seven miles from Colon, the canal makes another easy bend, the height of the land averaging 55 feet, excepting a hill near Matachin of 168 feet. The balance of the line to Panama is comparatively straight. From Matachin to Culebra, a distance of thirty-four miles, the land becomes more undulating, with a series of hills reaching altitudes from 100 to 240 feet, and at Culebra reaching the highest point on the line, 330 feet. From this altitude at Culebra the descent reaches to 30 feet at Río Grande, a distance of thirty-seven miles from Colon. From Río Grande to La Boca the line again runs through low lands from 30 feet to the level of the ocean, having reached the distance of forty-two miles from Colon. To reach the proper depth of water, dredging will be continued to a point near the islands of Perico, being a distance of forty-six miles from Colon. The two

ports, Colon and Panama, are to be improved, so as to make the entrance easy of access.

"The route in general follows that of the Panama Railroad. The dimensions of the canal are as follows: The breadth at the bottom is 22 to 24 metres (72 to 78 feet); the breadth at the surface of the water, 28 to 50 metres (92 to 164 feet); depth, $8\frac{1}{2}$ to 9 metres (28 to $29\frac{1}{2}$ feet). The curves on the canal are to have a minimum radius of 2,000 metres (6,560 feet). The greatest obstacle to be overcome on the Atlantic side, both in construction, maintenance and operation, is the Chagres River. It is a torrent of great and dangerous proportions at times during the rainy season, which continues during about eight months of the year; the maximum discharge during these annual freshets is nearly sixty thousand cubic feet per second. In November, 1879, during an unusual flow, the Panama Railroad was covered with water nearly eighteen feet deep for about thirty miles. As the canal is below the level of the railroad, the effect of this river on it when in flood and filled with sedimentary matters, may be disastrous. The depression through which the canal is to be built being situated between mountain ranges on each side, with steep declivities, all the water drains rapidly into the valley. The rainfall is excessive, being sometimes six inches in depth in twenty-four hours for days in succession. The river consequently rises rapidly, and the greater part of the valley is submerged. The only method by which the water flowing in the Chagres River Valley and the valleys of tributary streams can be diverted from the canal-prism, is to intercept it at some distance from the canal and drain it by lateral canals to the sea. In severe floods the surface-water of these lateral canals will be about seventy feet above that of the canal proper, requiring heavy guard-banks to restrain the anticipated floods. In other words, 'the water will have to be hung up on the sides of the mountains.' With the pressure that will be brought against the banks of these lateral canals during the heavy freshets, there will also be great risk of the water breaking through and so completely

filling the canal by sediment as to stop navigation until it is removed. It is the intention of the Canal Company to hold back and deflect the waters of the Chagres River at Gamboa by a dam constructed between two hills, thus forming an artificial reservoir. The height of the dam will be about 150 feet above the bed of the river. The water thus impounded will be conducted by lateral channels to the sea through deep excavations. One of these channels will be about thirteen miles in length, and its dimensions will be nearly the size of the main canal. The estimated cost of the dam, as given by M. de Lesseps, is \$19,000,000. The greatest constructive obstacle in the shape of excavation is the Culebra, or summit cut, which, on the axis of the canal, for about half a mile, has an average cutting of 100 metres (330 feet), or 360 feet from the bottom of the canal. The width of this cut (being on a side-hill) at the surface of the ground is about 300 metres (984 feet), and the depth for a few hundred feet on the highest point in this cross-section is about 164 metres (538 feet) from the bed of the canal.

“The canal, being built *à niveau*, requires a tide-lock at Panama, where the ordinary range of tides is eighteen feet. During storm-tides the range is much greater. The materials in general to be excavated are, on the marshes and valley of the Chagres River, a very fine alluvium in which is but little mineral silt; elsewhere, solid rock, clay mixed with conglomerate, with tufa (or compressed volcanic ashes) in the Cerro Culebra. From Culebra to Panama the route is through pyroxenic rock, sandstone tufa, and conglomerate. The total amount of materials to be excavated in the canal proper, according to the originally steep sections, is 143,000,000 yards, and, with the lateral cuts for the Chagres River, not including those required for the Chagres dam at Gamboa, is 13,000,000 cubic yards, or a total of 156,000,000 cubic yards. The amount remaining to be excavated, according to the reports of Lieutenants Winslow and McLean, U. S. N., February, 1885, is about 180,000,000 cubic yards; the time, twenty-six years at rate of progress of the last

year; and the total cost, including interest, \$350,000,000. The work has now (July, 1885) continued about four and one-half years; the results thus far obtained have been the removal of about 17,000,000 cubic yards, mostly material dredged from the marshes at Colon and the removal of the surface soil at various points on the line of the work. It is probable that with the large amount of plant now at work in the shape of dredges, steam-shovels, locomotives, cars, etc., 5,000,000 or 6,000,000 cubic yards per annum may be removed. At this rate of progress many years will elapse before the completion of the work. The money for building the canal is furnished almost wholly by the French people, who have entire confidence in Count de Lesseps. The obstacles of almost every kind, both constructive and political, which he so successfully overcame in constructing the Suez Canal have given him a high reputation.

"In the maintenance and operation of the canal there are certain fixed conditions which will entail a great expense, and perhaps at times serious delays to commerce: First, the tide-gate at Panama; second, the effects of the great rainfall of about 120 inches per annum on the Atlantic side, which will be a constant menace to the canal, and no doubt at times a serious obstacle to its operation; the effects of these excessive rains upon the clayey slopes of the canal can hardly be estimated; third, the perpetual calms that prevail for a long distance on both sides of this Isthmus at this point will prevent the use of the canal by sailing vessels, in which now most of the commerce between the Pacific coasts and Europe passes around Cape Horn.

"The estimated commerce for the canal transit in 1889 is 6,000,000 tons. There is no doubt that the accomplishment of this work would revolutionize the world's commerce and increase the prosperity of many nations.

"The following authorities have been consulted, and are now stated for reference: *Congrès International d'Études du Canal Interoceanique* (1879); report of Lieut. R. M. G. Brown, U. S. N. (1884); report of Lieut. R. P. Rodgers, U. S. N., February 28, 1883; 'Maritime

Canal of Suez' (pp. 130-153), by Prof. J. E. Nourse, U. S. N.; paper by Charles Colné, read before Franklin Institute, October 22, 1884, on 'The Panama Interoceanic Canal;' 'Problem of Interoceanic Communication by Way of the American Isthmus,' by Lieut. John T. Sullivan (1883; issued by Bureau of Navigation, Navy Department); reports of Lieut. Francis Winslow and Lieut. R. H. McLean, U. S. N., February, 1885; also report of Lieuts. M. Fisher Wright and Alfred Reynolds, U. S. N., February 5, 1885."*

The present status of the Panama Canal may be defined by stating that after seven years work and an expenditure estimate of over \$220,000,000, M. de Lesseps has abandoned his pet tide-level scheme, and at the eleventh hour adopted locks. About one-fifth of the work originally planned has been done. The fixed charges of the company to-day on their shares and bonds and the maintenance of the Parisian and Isthmian offices, exceed \$22,000,000 per annum. This does not include the turning over of a single shovelful of earth.

A word regarding the Eiffel contract, regarding which one hears so much. It is probably one of the most remarkable documents that ever was drawn up between a contractor and a corporation. All of the provisions are absolutely in favor of the contractor. He exacted a huge deposit; for as much as one million of dollars, or five millions of francs, were placed to his credit in the hands of two banking firms in Paris, before he commenced any work at all. Then his staff, that was sent to Panama, was paid six months in advance by the Canal Company. One of the engineers on that very work told me, while in Panama in March, 1888, that the contracts called for ten gates, at one million of dollars each, while the masonry and wherewithal to constitute a lock, was to be a separate charge. Thus we have ten millions for ten gates, and, say five millions for masonry—total, fifteen millions. The fact never to be lost sight

* Johnson's Universal Cyclopædia, Vol. VII. 1887.

of is this, that M. de Lesseps has stated that they are to be temporary locks. These are his own words.

With his usual nonchalance, in comparison with which an Arctic temperature is midsummer, he has assured his countrymen and countrywomen (for there are upwards of thirty thousand female shareholders in the canal), that while the locks are working he will go on digging down to tide-level along-side of his lock-canal. This probably is one of the most remarkable statements that has ever emanated from human lips—and for a variety of reasons. Picture to yourself a lock-level canal built through the ever yielding clayey soils of the Culebra. Let us say that that is done. There is no water on that level with which to aliment or feed a canal. Pockets are to be constructed on the side of that hill as mountain reservoirs. By strengthening their walls with a backing of iron plates they hope to make them strong enough and large enough to hold M. de Lesseps' promises—I really beg his pardon—I mean water, to aliment the upper levels of the Panama Canal. This water has to be pumped from distant streams. Let us say the pumping apparatus gets out of order; then we have no water and the canal will be useless on that occasion. On the other hand, let us say that the reservoirs are full, and that there is one of those sociable little earthquakes, such as have been alluded to, and the walls of the reservoir give way, break into the main ditch, and sweep away the locks.

Again, let us say, that everything goes on just as they have stated—smoothly and the like. Then, according to M. de Lesseps, in that narrow mountain gorge in the Culebra he is going down to tide-level. In view of the fact that the sides of the Culebra move into the cut at the rate of some eighteen inches per annum—and that on a cut of less than eight feet—what can one expect will happen to his lock-canal after he has got below its level?

In short, the building of a tide-level canal alongside of the lock-canal is a physical impossibility, and there are no modern underwriters that would put a dime of insurance on vessels going through a canal at that time.

There is another feature in connection with these locks that should afford M. de Lesseps considerable food for thought, and it is this. The plans on which his locks are being built to-day are those designed by M. Eiffel for a former Nicaragua Canal Company. In view of his bitter denunciations of the latter route—as to it being a land of earthquakes, making lock-canals useless—his present conversion is as amusing as it is instructive.

As we are all aware, M. Eiffel is building a thousand foot tower, to be completed for the opening of the Paris Exposition of 1889. As M. de Lesseps boasts that he has behind him half a million of share and bond holders, perhaps they will ascend that tower and stretch their eyes towards the west to look for the Panama Canal, in the same way that the Spanish king gazed from a window, and said that he thought Panama could be seen, owing to the cost of its walls.

The engineer in the Eiffel employ, from whom I obtained many of the details just used, told me there never will be a canal on the Isthmus, with or without locks. When the present money is exhausted a crash is inevitable.

In fact, I made bold to make a forecast while at the American Association for the Advancement of Science, at its meeting in Cleveland, on the 15th of August, 1888, when, in my paper before the section on engineering, I stated that within six months the company would be in hopeless bankruptcy and that M. de Lesseps' famous *petite gens de bas de liane* would be hopelessly ruined.

The bursting of this South Sea Bubble No. 2 will shake France to its centre. Add to this the commercial stagnation in Europe and the ever increasing darkness in the political horizon, and you have a group of facts sufficient to appal all having any interest in the Panama Canal. *La Belle France* is laden down by a huge debt; already three times that of the United States of America. This is constantly increasing, and the bursting of the canal bubble will hasten a financial crisis in France that unquestionably will affect all having commercial relations with her.

Despite the rose-colored statements to the contrary, very little real work is being done on the Panama Canal at this writing. Work has been stopped on a number of sections, the nominal excuse being that they are completed. But such is not the case. Work has been stopped because the company is without means to pay the contractors. At this time lawsuits aggregating several millions, for damages and for breach of contract, are hanging over the Panama Canal Company. A lot of its plant on the Isthmus was advertised for a judicial sale, and among other things that were enumerated in the list, were the Canal Company's hotel, and their works and plant at the Boca. That was for a judgment of \$400,000. That case, I believe, has been settled, and a number of contractors who have been dispossessed, and whose contracts had been given to others for advanced rates, have sued the company. One of these contractors, M. Murraciale, a Frenchman, recovered one million of francs damages. The system of dispossessing men who are doing their best, and giving their work to others at advanced rates, is one of those things that no fellow can understand on business principles. The sums, paid by the Panama Canal Company for the indemnification of those so dispossessed, or men whose contracts were cancelled, together with the suits in court and judgments against the company, have aggregated over twenty millions of francs, and that, irrespective of the costs.

The seven great contracting firms on the canal are the following :

First, The American Contracting and Dredging Company, who have from kilometre one to kilometre twenty-six. The huge dredges of this company have cut inland some fourteen miles. During my visit to the Isthmus in April, I went over the derivations and the cut made by this company. In many places the channel was from twenty-two to twenty-six feet deep, with an average breadth of, say, one hundred feet. In the upper portions of the cut the depth is six to eight feet, and in making it they have given the Chagres a new channel. That stream, instead of emptying into the Atlantic at the

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village of Chagres, at the mouth of the river, now flows in part through the canal into the Bay of Colon. The consequence is that during the rains an immense amount of earth is brought down, and it is feared that in time a bar will be produced in the harbor of Colon, or Navy Bay, in the same way that bars mark the mouths of all tropical rivers.

The second contracting company, taking them in their order from Colon to Panama, is *L'Entreprise Jacob*, working in the axis of the canal at Mindi and on the "derivations" of the river Chagres.

The third contracting company is *Vignaux Barbaud Blanleuil & Co.*, who have the contract from kilometre twenty-six to kilometre forty-four.

The fourth contracting company is the *Société Travaux de Paris*, who hold the contract from kilometre forty-four to kilometre fifty-five.

The next contracting company is that of *Artigue, Sonderegger & Co.*, whose contract extends from kilometre fifty-five to kilometre sixty-two. This is the famous Culebra section.

The sixth contracting company is that of *Baratoux, Letellier & Co.* Their contract covers the canal from kilometre sixty-two to kilometre seventy-six, or off Isla de Naos.

The seventh and last contract is that called *L'Entreprise Eiffel*, which has contracted for the gates—if such a document as it holds can be called a contract.

Some eighteen months ago M. de Lesseps announced to the world that five great contracting firms had pledged themselves to deliver the canal cut to tide-level, but that promise of course is of no moment, now that they have decided on having temporary locks. I have information from a source that I know to be reliable, that the great contracting firms mentioned, had placed to their credit before commencing any work, the handsome sum of \$1,000,000 each, which they were allowed to expend for the purchase of the plant deemed necessary, and when the said sum was expended it was considered as so much work done, and they were at liberty to make

an additional charge of fifteen per cent. thereon as profit.

The famous Bureau System is what has obtained on the Isthmus up to this present time, with changes and amplifications without number. There is enough bureaucratic work, and there are enough officers on the Isthmus to furnish at least one dozen first-class republics with officials for all their departments. The expenditure has been something simply colossal. One Director General lived in a mansion that cost over \$100,000; his pay was \$50,000 a year, and every time he went out on the line he had his *deplacement*, which gave him the liberal sum of fifty dollars a day additional. He travelled in a handsome Pullman car, specially constructed, which was reported to have cost some \$42,000. Later, wishing a summer residence, a most expensive building was put up near La Boca. The preparation of the grounds, the building, and the roads thereto, cost upwards of \$150,000.

The way money has been thrown away is simply astonishing. One canal chief had had built a famous pigeon-house while I was on the Isthmus recently. It cost the company \$1,500. Another man had built a large bath-house on the most approved principles. This cost \$40,000. Thousands and tens of thousands have been frittered away in ornamental grounds, for all had to be *beau*, utility being a second consideration.

M. Rousseau was sent to the Isthmus in 1886 by his government to report upon the Panama Canal. His inspection was to be preliminary to the emission of a lottery loan providing his report was favorable. M. Rousseau was a keen, practical man. While it was quite true that theatrical effects were introduced, he was not deceived.

During my last visit to the Isthmus I went over the work, note-book in hand, and made sixty photographs. I can summarize all by stating that the effect was more than depressing. The Canal Company take credit for thirty million dollars worth of machinery on the Isthmus of Panama. The greater part of this machinery has

been left out in the open, and a prominent engineer told me that two-thirds of it is absolutely useless; and it wouldn't pay to take it away for old metal. Five millions of dollars have been spent in creating a very pretty, well kept tropical town at Christophe Colon. Sidings are covered with valuable engines and all kinds of movable plant which are out in all weather and going to ruin.

The canal hospitals on the Panama side are without doubt the finest and most perfect system of hospitals ever made within the tropics. There are upwards of seventy buildings, and their cost has been over four millions of dollars. That service alone is simply huge.

The following figures are taken from a report of Mr. Armero, a Columbian officer, which was made up the 30th of June, 1886. His official figures are:

Excavations of 14,000,000 cubic metres, \$28,000,000; material purchased, \$22,000,000; combustibles, \$3,800,000; explosive material, \$1,300,000; purchase of Panama Railroad, \$18,685,088; encampments on the line, \$9,000,000; *Central Hospital at Panama*, \$5,600,000. *Hospital at Colon, and ambulances*, \$1,400,000. Stables, \$600,000; carriages and horses, for employees, \$215,000; servants for employees, \$2,700,000; mules and wagons, \$152,000; buildings for offices, private residence for the manager, country seat for the same—grounds, etc., \$5,250,000; parlor car for the same, \$42,000; sanitarium at Toboga, \$465,000; indemnity to commissioners (sent at the Canal Company's expense to report on the canal), \$2,000,000; indemnity to contractors (for company's failure to carry out certain contracts), \$2,300,000; wages of employees on the line, \$5,000,000; offices at New York, Paris and Panama, \$8,400,000; police on the encampments, \$2,300,000; pharmaceutical staff, \$4,800,000; interest at five per cent on capital, \$30,000,000—Total, \$154,509,088.

The above figures are instructive, and as they emanate from a Colombian officer then on the Isthmus, who was watching the matter for his government. they tell their own tale.

Mr. Armero's report was a fearfully wet blanket to the company.

Now, I think it time to turn to some of M. de Lesseps' official literature and compare his promises one by one, as they have appeared in print, and then allow my readers to draw their own conclusions.





**THE PANAMA CANAL—ITS PRESENT CONDITION AND ITS FUTURE
—THE ENTERPRISE JUDGED FROM M. DE LESSEPS' OFFICIAL STATEMENTS.**

THE problem of interoceanic communication by way of the American Isthmuses is a very old one. I refer to the Isthmus of Panama, the Isthmus of Darien, and the Nicaragua route. The plans and schemes by which two vast oceans were to be married, to borrow one of M. de Lesseps' similes, are too numerous to be detailed here. The idea of connecting the oceans is almost coincident with the discovery of the Pacific by Vasco Nufiez de Balboa, as may be gathered from the following:

"In the town library at Nuremberg, is preserved a globe, made by John Schöner, in 1520. It is remarkable that the passage through the Isthmus of Darien, so much sought after in later times, is, on this old globe, carefully delineated." *

Among the Spaniards, Gomera, a historian, was the first to advocate the union of the oceans by means of a canal. Three hundred and thirty-seven years ago all of the schemes that have received consideration recently, were on the tapis. There was the old Panama scheme, the Nicaragua scheme, and the Tehuantepec scheme. These were submitted to Philip II. and his court. Gomera was one of those clear thinking, enthusiastic men to whom obstacles were but new stimulants to victory. When he was confronted with the difficulties to be overcome in the canalization of the Isthmus he said, addressing his king, "'It is quite true that the mountains obstruct these passes, but if there are moun-

* King's "Wonders of the World."

tains there are also hands. Let but the resolve be made and there will be no want of means; the Indies to which the passage will be made will supply them. To a King of Spain with the wealth of the Indies at his command, when the object to be attained is the spice trade, what is possible is easy.'

"But the sacred fire had burned itself out. The peninsula had a ruler who sought his glory in smothering free thought among his people, and in wasting his immense resources in vain efforts to repress it also outside of his own dominions throughout all Europe. From that hour Spain was benumbed and estranged from all the advances of science and art, by means of which other nations, and especially England, developed their true greatness." *

What that historian sought and recommended to the King of Spain, was the spice trade of the Indies. In a paper read before the Natural History Society of Santa Barbara, California, on the 8th day of June, 1885, I used the following words:—

"This was the starting point of the canal question, a question thought of then as a means of developing the spice trade with the Indies; a question that to-day, and in the near future promises to be spicy enough for the Governments of France, United States of Colombia, and the United States of America, and interesting to all students of international law."

No fact is better known to students of the literature bearing on this subject than that the early surveys were excellent, and in the early part of this century Admiral Fitzroy, of the British navy, said that no surveys need be better. The people who have been prominent in the past in connection with the work, have been the Dutch, Swedes, English, Scotch, and, in modern times, the French and Americans.

"This exclusive policy of Spain was manifested as late as 1775, when, on the presentation of a memoir by

* "Problem of Interoceanic Communication;" Sullivan. Washington.

the citizens of Oaxaca for improving the Tehuantepec route, the memorialists were censured as intermeddlers, and the Viceroy fell under his sovereign's displeasure."

Kingly indifference and an iron hand crushed all projects, and plans were in abeyance until 1808, when Humboldt again drew the attention of the world to the subject. Later, in 1823, the then Kingdom of Guatemala, whose southern boundary made a part of the present State of Panama, threw off the Spanish yoke, and the new Republic of the centre of America stirred in the matter. Surveys were made in 1824-26, 1828-30, 1835-38, 1846-47, and on to our own time.

The literature on Isthmian surveys is most voluminous. Passing from times past to things of to-day, I have to state that the first surveys for the present Panama route were made under Lieut. Lucien Napoleon Bonaparte Wyse. As it was quaintly observed by the late Admiral Pim, they did not command universal respect. By referring to Lieutenant Sullivan's admirable compilation,* some of the peculiarities of that survey may be briefly stated as follows. It commenced on the Panama or Pacific side but did not extend to the Atlantic, nor anywhere near it. Still, incredible as it may seem, Lieut. Lucien Napoleon Bonaparte Wyse gave a minute plan for the construction of a canal, even to its cost within ten per cent. There was much that was remarkable about that survey. Lieut. Lucien Napoleon Bonaparte Wyse was acting for a society calling itself the *Société Internationale du Canal Interocéanique*. Lieutenant Sullivan's compilation says that, "Lieutenant Wyse was not instructed to seek the best line, but the best line in a certain territory, where the society could secure a concession and profit by its sale." In 1878 he was again authorized by this society, to return and complete his surveys. What a commentary on the word "complete," particularly, as he had previously

* "The Problem of Interoceanic Communication by Way of the American Isthmus." By Lieut. John Sullivan, U. S. N. Issued by the Hydrographic Department, Washington.

completed his canal on paper even to calculating its cost! He returned to the Isthmus and did a lot of helter-skelter work and obtained a concession in Bogota which embraced the whole country of the United States of Colombia, thus including all the proposed canal routes except that of Nicaragua. As the result of the above explorations, and those made in 1876-7, the following plans for a canal were devised. The dimensions proper were, breadth at bottom twenty metres, (a metre is 39.333 inches), at three metres from the bottom, twenty-six metres; at the surface from thirty-two to fifty metres, according to the nature of the soil. Depth eight and a half metres at mean low tide. Tunnel, breadth at bottom, twenty-four metres; at surface, twenty-four metres; height above level water, thirty-four metres. It was with these dimensions that the estimated prices were calculated; twenty-five per cent being added to the price so obtained.

The surveys made there by both English and American engineers advocated a tunnel, and one of the most thorough of these surveys was that made by the late Commander J. E. Lull, U. S. N.

We have now brought this brief summary up to the spring of 1879. On the 15th day of May the now celebrated International Conference was held at Paris to select a route. It goes without saying that the *Société Internationale du Canal Interocéanique* had not been idle. It held the concession. General Türr and his brother-in-law, Lieut. Lucien Napoleon Bonaparte Wyse, were the exponents of each and all the extraordinary advantages possessed by the Wyse route. It was at that conference that M. Ferdinand de Lesseps appeared on the scene, and subsequently it transpired that he had sent Lieut. Lucien Napoleon Bonaparte Wyse and his party on their second expedition. We read that the meeting was opened with great formality. A president, five vice-presidents, a general secretary and four other secretaries were named. Five committees were appointed and subdivided. The president vacated the chair, but it was taken by the "great undertaker"

of the French, M. de Lesseps. Captain Bedford F. C. Pim, R. N. (later Admiral), and Lieutenant Sullivan, U. S. N., state that the conference was composed of one hundred and thirty-six members, of whom seventy-four were French and sixty-two of different nationalities. Forty-two were engineers. Of the forty-two engineers, thirteen had been on the Suez canal. The remaining ninety-four members, were bankers, politicians, speculators, members of the geographical societies, and army and navy officers.

American interests were represented by Admiral Daniel Ammen, a civil engineer, and Mr. A. G. Menocal, of the United States navy, gentlemen who are profoundly versed in all knowledge referring to both routes; Mr. Menocal having been on the long survey of 1875 at the Isthmus of Panama, and Admiral Ammen having had intimate knowledge of both routes.

English interests were represented by Sir John Hawkshaw. Captain Pim, R. N., had been named a delegate. He had conducted extensive surveys all along the coast of the Isthmus and to the south, for his government, and was thoroughly familiar with the ground. An accident prevented his attending the conference. Three of the gentleman named could have given the conference most valuable and instructive information, but they found a pre-arranged meeting, where their views went for naught. The Panama route was to be, and was adopted as M. de Lesseps had intended it should be. He bulldozed his committees and reigned with a rod of iron. Reasonable objections made by M. Lavalley, who referred to *le grande inconnue de la Chagres*, and other eminent French engineers, were practically silenced. A most important fact, which must not be overlooked, is that the Wyse concession was sold to the Canal Company for the modest sum of ten millions of francs, or two millions of dollars. On the 29th day of May the conference held its final session, and after giving a recapitulation of the principal schemes as prepared by the sub-committee of the 4th, or Technical Committee, the following was put to a vote:

"The conference deem that the construction of an interoceanic canal, so desirable in the interests of commerce and navigation, is possible, and in order to have the indispensable facilities and ease of access and of use, which a work of this kind should offer above all others, it should be built from the Gulf of 'Limon' (Colon) to the Bay of Panama."

This resolution was carried by a vote of seventy-eight members, nineteen of whom were engineers and professional men. Of this number nine had been connected with the Suez Canal; eight voted no, including M. Lavalley and other equally independent thinkers; twelve abstained from voting and thirty-eight were absent.

The conference simply gave form to what had been decided upon previous to the meeting. M. de Lesseps, in a skilful, diplomatic way, had forecast the whole thing, had instructed who should be invited, and had pre-arranged the issue. It partook of the nature of a farce, and one of magnificent proportions. Still it had attained its object and had secured a high sounding name, and its findings appeared before the world as a properly matured scheme. Following it a technical commission to visit the Isthmus of Panama was in order.

It was composed of engineers of renown, geologists, and others; such as Col. Geo. M. Totten, Chief Engineer of the Panama Railway, Gen. W. W. Wright, United States Engineers, Gen. Dirks, Victor Dauzats, E. Bouton, Pedro A. Sosa, Alexander Ortega, C. Convreux, Jr., and Gaston Blanchet. These, with M. de Lesseps and many others, visited the Isthmus early in 1880, during the dry or best season of the year. They had a delightful time and were fêted right royally. M. de Lesseps was enchanted with the blue skies and genial air of the early dry season. Good Dame Nature appeared in her becoming mantle of tropical vegetation. With that inimitable fluency of language peculiar to the French, in his reports he painted the Isthmus as the true garden of Paradise.

To get back to Italian skies, tropical scenes and the two earlier openings of the canal, I want my readers to bear in mind that the commission with M. de Lesseps on the Isthmus of Panama agreed to estimate the cost of the work at the prices fixed by the Paris Congress, and the following estimates were given out by the commission:

You will please bear in mind that the Commission based its calculations on the figures of the Paris Congress and placed the total cost of its construction at 843,000,000 francs, or taking the francs at five to the dollar, we get the sum of \$168,600,000, United States gold.

The Commission sailed for New York in the steamship *Colon*, Captain Griffin, of the Pacific Mail Steamship Company. While on its way to New York, M. de Lesseps reduced the \$168,600,000 to \$120,000,000. He floated \$60,000,000 or 300,000,000 francs as his first loan, and gave out that the canal could be completed for 600,000,000 francs or \$120,000,000.

The route lies between the city of Colon on the Atlantic and the city of Panama on the Pacific coast. Leaving Colon it closely follows the line of the Panama Railroad, crossing amid swamps and quicksands in the Mindi district to Gatun on the river Chagres; thence onward to Emperador. Leaving Emperador, the highest point on the range or "divide," is reached, namely Culebra, from where it descends the valley of the Rio Grande to the Bay of Panama. From near Paraiso on the Panama side, the canal, if ever completed, will pass through six miles of swampy country.

In the swamps on both sides of the Isthmus, there is a luxuriant growth of vegetable life, owing to the ever present factors great heat and great moisture, with a corresponding rapid growth and decay. Quite apart from these most important factors in the production of malarial poisons, there is a constant admixture of salt and fresh water, the latter coming from the interior laden with the remains of decomposing vegetable organisms. All the best known factors for the production of intense malarial poisons there exist.

M. de Lesseps' plans are, briefly: an open cut canal, on tide-level, from ocean to ocean, at a uniform depth of twenty-seven feet, six inches below the level of both oceans. Its length will be some forty-five and a half miles. Width at bottom seventy-two feet, at water line ninety feet. Owing to the great difference in the tides of the two oceans, a vast tidal basin must be constructed on the Pacific side. The basin will be made in the swamps of the valley of the Rio Grande, extending inland towards Paraiso.

M. de Lesseps in his calculation of \$120,000,000, made no provision, I believe, for a tidal basin. That, now planned by M. Jules Dingler, of the Ponts et Chaussées of France, the Director General of works at Panama, is a magnificent affair, which will be nearly three quarters of a mile square. An engineer who had just completed surveys there informed me that this basin will cost fully \$30,000,000 additional, a handsome sum in itself. It was barely six months ago that the Canal Company had a final survey made of this locality. M. de Lesseps and his Technical Commission, in their very superficial survey, had looked on it as a swamp only. A swamp only, say you! Yes; but fancy the company's surprise after having been on the Isthmus fully three years and a half, to learn that under the surface of that peaceful malarial breeding swamp, at a varying depth of twelve to sixteen feet, was one vast ledge of volcanic rock! This final and complete survey was made by American engineers.

Next in order is the cut at Culebra, a vast undertaking in itself. The calculations for the angle or sides of this deep cut were placed at one in one. Such an angle would be impossible in a country where the rain falls in torrents and where the Upper Chagres River has risen sixty feet between banks as a result of a single day's rain. The sides, to have any stability, must be one in four. What does one in four mean? First picture to yourselves a hill 339.6 feet above sea level; to this add 27.6 feet to reach the bottom of the canal, and it gives a total depth of the cut as 367 feet, with a breadth at the bottom of 72 feet, at water line of 90 feet. From this

point upwards calculate the sides at one in four, and it gives a vast cut of nearly three-fourths of a mile across.

In M. de Lesseps' calculations, the railroad level of 238.6 feet at the summit was used. Later surveys showed that the bend there would be too sharp. The next best level was 100 feet higher, and on the latter they are now working. It is said that this will add at least another 20,000,000 of cubic metres of excavation not included in the original estimates, that will cost anywhere from \$40,000,000 to \$50,000,000 additional. An officer of the United States Navy estimates that this cut alone will take at least ten years to complete.

Then comes the problem of damming the Chagres River at Gamboa. This is another colossal undertaking—the penning up of the waters of a tropical river, which drains a great valley region amid mountains. In the original estimates \$20,000,000 were allotted for this purpose. Up to the time of my leaving Panama, on the 25th of April, 1888, no plan had been made public that solved this knotty point. Survey after survey had only developed new difficulties. The proportions of the projected dam as taken from the report of Captain Bedford Pim, of the British Navy, to the late Mr. Frelinghuysen, Secretary of State for the United States of America, is as follows:

Length at base,	1,050 metres.
Length at top,	2,110 metres.
Thickness,	330 metres.
Height,	47 metres.

When we know, and realize, that there is no rocky foundation on which to place such a colossal dam, we are dazed at the daring of the whole scheme. Let us suppose the dam built, to divert the river. A new bed will have to be dug for it some nine miles to Colon, where its new outlet will be to the north of that city. A prominent canal engineer said to me: "The damming of the Chagres River seems a hopeless task. I, as a Frenchman, should not say so, but it is true nevertheless."

Every five or six years vast inundations fill the valley of the Chagres and Upper Obispo. Twelve miles from Panama is Emperador, across the "divide" towards Colon. The railroad follows the valley of the Chagres and the Obispo as well; while the canal closely follows it. Hills of considerable height are met with on the Colon side, and in the valley between these hills the waters pile up in fine fashion. During the last heavy flood in the fall of 1879, there were from twelve to eighteen feet of water in many places over the bed of the railway. A Colombian engineer on the Commission, Mr. Pedro Sosa, during that flood took a bungo or canoe at Tiger Hill, some nine miles from Colon, and proceeded direct to Emperador or over what will be fully twenty-six miles of the projected canal. The flood lasted four days, washing away houses, the track, etc. Such are the tropical floods of that locality. What will become of a tide-level or any other canal under such treatment need not be dwelt on.

Here again an American engineer comes to the front. The Canal Company had had their legions of engineers at work for nearly three years, and knew nothing of these floods. Mr. Robt. K. Wright, Jr., late of the U. S. N., made a report on these floods and furnished reliable information. An undeniable fact of this nature proves very conclusively that the French entered on the building of the canal hastily and without due knowledge.

Having but too briefly considered the tidal basin, the gigantic cut at Culebra, the unruly Chagres, of which a canal chaplain said: "They must dam it or it will damn them;" let us consider the last of the very prominent obstacles that beset M. de Lesseps's Panama Canal scheme. I refer to the swamps and quicksands at Mindi, a few miles inland from Colon.

In building the Panama Railway, as I have already stated, the late Col. George M. Totten, the chief engineer, found in the swamps of Mindi a very serious obstacle. When his staff commenced their soundings they failed to get bottom at 180 feet. But as he was building a

railway the difficulty was solved, as at Chat Moss, by throwing in immense quantities of wood, earth, etc., and finally floating the road bed on the materials below.

When we consider that the swamps extend for several miles, and remember that below are quicksands, we can judge of the almost insurmountable difficulty at this point for a canal. It is said that the French engineers, after diverting the course of the Chagres, hope to use its waters to flush this immense body of sand out to sea. Excellent, if possible; but if possible, what becomes of the deep water harbor at Colon, on Limon Bay?

On the 28th February, 1881, the first detachment of canal engineers reached Colon, or Aspinwall, and proceeded direct to Panama. Then followed surveys, the building of small villages along the proposed line of the canal, the erection of hospitals, and an immense amount of gush on paper. Many of the accounts of the work done, and published in the Parisian press, read like a tale of magic. I do not offer any translations of the *couleur de rose* statements, fearing that their French fragrance may be lost in our plain English tongue.

At the annual meeting of the share and bond holders in July, 1884, M. de Lesseps said that the canal could be completed in 1887, and that this had been proved mathematically—I quote his own words—but to err on the side of safety, he would add a year, and say December, 1888, for its final opening. He brought forward the budget for the next year, etc., etc.

In 1884, *La Bourse Pour Tous*, a Parisian paper, announced the indebtedness of the company to its share and bondholders as being 700,000,000 francs, or \$140,000,000 gold. Annual interest 22,875,000 francs, or say \$4,500,000 in 1884.

After four years' work and an expenditure said to vary in amount from \$90,000,000 to \$125,000,000, how much has been done? Taking their own figures, a twentieth of the whole will be a generous estimate. The gross cube to be removed was at first 75,000,000 cubic

metres; it rose to 88,000,000, then 110,000,000, when Mr. Joseph W. Adamson, C. E., Vice-Consul General U. S. A. at Panama, calculated it for an expert and placed it at 150,000,000. Later his calculations were verified by an officer of the Panama Canal Company, who in a new estimate gave it at 153,400,000 including the new basin, etc., being more than double the original calculations.

As far back as 1884 I said and wrote :

"The canal is a commercial impossibility, and the end is not far distant. Unless an immense loan is floated within six months, in another year work will have ceased and thousands and thousands of shareholders will have lost their all in what looks uncommonly like a South Sea bubble. To complete it would cost probably from \$400,000,000 to \$500,000,000 ; such a fabulous sum that no existing tonnage would pay interest on it.

"Finally the canal has had a political aspect. I say *has* had, for the kindly intervention of the American forces at Panama not only saved that city from the fate that destroyed Colon, but showed the world at large that this vast and great Republic will permit no foreign intrigue on the American Isthmus and further that she will see that peace and order is maintained there according to her treaty with Colombia." *

The *Economiste*, June 25, 1886 : "True patriotism consists in preventing one's country from ruining itself for the profit of another.

"Considering the blindness of those who advocate it, the undertaking of the Panama Canal may be considered an equivalent of the war of 1870. Within due proportions, it is a similar unfathomable and irreparable disaster which is in preparation."

Economiste, July 23, 1887 : "At the fatal point which they have now reached, if the administrators, shareholders and bondholders do not know how to make the necessary sacrifices, the year 1889 or 1890 will witness the most terrible financial disaster of the

* The *Independent*, Santa Barbara, Colombia, June 20, 1885.

nineteenth century and probably of all modern history."

The *Economiste Français*, December 3, 1887: "From all information received through other channels than the company, it is really shown that the situation of the undertaking, is getting more and more hopeless. According to the calculations of Mr. Tanco Armero, the Colombian delegate to the company, the completion of the canal would necessitate an expense of 3,000,000,000 francs* (\$579,000,000) for actual work, which with the general expenses and interest would represent over 4,000,000,000 francs (\$772,000,000) still to pour into this abyss. The year 1888 will certainly see the liquidation of the company. The lottery-bonds can do nothing towards meeting such great necessities."

"The documents published by M. de Lesseps and the company, documents which will be found reproduced further on, go to corroborate the opinions expressed by M. Leroy Beaulieu, and will remove all doubts from the minds of those who still have faith in this disastrous affair.

"I must add that as the interoceanic *Bulletin*, from which I take the extracts, is the only *official journal* of the company, these citations cannot be refuted.

"We shall now review the various questions raised by the letter addressed on November 15, 1887, by M. F. de Lesseps to the Cabinet of the French Republic, requesting the authorization for raising a loan of five hundred and sixty-five million francs secured by lottery bonds."

The above is from Philipon's letter published in *Suez and Panama*.

FIRST ESTIMATE.

Bulletin, September 1, 1879, page 6: "We will call attention to the fact that the real cost of the tide-level canal, via Panama, is six hundred and twelve million francs."

* One franc is worth \$0.193.

SECOND ESTIMATE.

Bulletin, March 15, 1880, page 116: "I recapitulate my reductions" says M. F. de Lesseps. "Total one hundred and eighty-four millions to deduct from eight hundred and forty-three leaves indeed *six hundred and fifty-eight million francs* to figure upon, I make no remarks as to the quantity or price per cubic metre of soft or hard rock, but on this head *great savings* can be expected which will *more* than compensate the interest to pay to the shareholders for the capital invested during the construction."

N. B.—It is really surprising to see M. de Lesseps, who is not an engineer, reduce by a mere stroke of the pen, the estimates made by a congress, and the capitalists must be very blind who put a thousand million francs into an enterprise entered upon with so much thoughtlessness.

THIRD ESTIMATE.

Bulletin, June 15, 1880, page 182: "All that it will cost will be *five hundred millions* to spend in six years."
—(F. de Lesseps.)

FOURTH ESTIMATE.

Bulletin, December 1, 1880, page 225: "It is now known what the cost of the canal may be expected to be; the expenses will not run over *six hundred million francs*, and the work will be completed in *six years*."

And so on, until 1885, when the company discovered that it had spent nearly five hundred millions and that the promised canal was hardly commenced.

FIFTH ESTIMATE.

Letter of May 27, 1885, from the company to the Minister of the Interior: "The expense of constructing the tide-level canal will approximate *one thousand and seventy million francs*."

SIXTH ESTIMATE.

Bulletin, March 12, 1886: "The cost of the tide-level Panama canal will be one thousand and seventy millions, and with the interest, *one thousand, two hundred million francs.*"

Seventh estimate of a tide-level canal suddenly transformed into a provisional lock-canal, 4 metres, 57 centimetres in depth, instead of 9 metres.*

Extract from the letter of November 15, 1887, to the Prime Minister: "*I have the honor to ask the authorization of raising a loan of five hundred and sixty-five million francs, which may be necessary.*"

If we add these five hundred and sixty-five millions to the one thousand and fifty-nine millions resulting from the loans and temporary investments and receipts of the railroad, we have a total of one thousand, six hundred and fifty-four millions, which is such a considerable sum that it would have been sufficient to establish *two canals, a tide-level one estimated at one thousand and seventy millions, and one with locks estimated at five hundred and seventy millions.*

We read, indeed, in the *Bulletin* of September 1, 1879, page 6: "The lock-canal via Panama is only estimated at five hundred and seventy millions, it is true, whereas the expenses of the tide-level canal would be in the neighborhood of one thousand and seventy millions."

Let us recapitulate these estimates:

First September, 1879, cost of a tide-level canal, completed,.....	612 millions.
Second March, 1880, cost of a tide-level canal, completed,.....	658 millions.
Third June, 1880, cost of a tide-level canal completed,.....	500 millions.
Fourth December, 1880, cost of a tide-level canal, completed,.....	600 millions.
Fifth May, 1885, cost of a tide-level canal completed,.....	1070 millions.

* One metre equals 3.2808992 feet.

Sixth March, 1886, cost of a tide-level canal completed,.....	1200 millions.
Seventh November, 1887, cost of an <i>unfinished, provisional canal with locks</i> , and 4 metres 57 centimetres in depth, instead of 9 metres,.....	1654 millions.

We are far indeed from the famous contract of Couvrex & Hersent, which guaranteed the entire digging of a tide-level canal, for five hundred and twelve millions, and equally far from the calculation of the Congress which estimated it at *five hundred and seventy millions*, for a *complete and not temporary lock-canal*.

ESTIMATED TRAFFIC.

Extract from M. de Lesseps' letter of November 15, 1887: "*To give passage, commencing the first year, to a traffic calculated at 7,500,000 tons.*"

For eight years past the publications of the company, state and repeat in every issue, that Mr. Levasseur, in his report to the congress, stated that 7,500,000 tons will pass through the canal the year it is opened.

Mr. Levasseur has never made such a statement and the company knows it better than any one, as it published in its *Bulletin* of February 15, 1880, page 104, the report of Mr. Levasseur, of which the following is an exact copy:

"It is important that the bearing of these figures be not misunderstood. They do not mean that the 7,250,000 tons will necessarily pass through the canal *the year of its opening, nor the succeeding years. . . . We give in a lump the gross amount; we do not say what share of it will go to each of the means of communication which will then exist across or south of the American continent.*"

As may be seen, the honorable Mr. Levasseur never wrote what the company credits him with.

To get an idea of the value of this *total* traffic estimated by the Congress, it is well to know that the total of 7,250,000 tons was established *without documents*

or by means of *vague and uncertain documents*, and after *six sittings* of a total duration of six and three quarter hours. (See the report of the meetings of the Congress of 1879, page 25 and subsequent pages.)

The Congress declared therefore that during the year of the inauguration of the canal, the *gross* traffic of the American continent with the whole world would probably be 7,250,000 tons, without stating which way *all* or *part* of this total would take.

In order to further its enterprise, the company takes the total of 7,500,000 as the traffic assured to the *temporary lock-canal*, and by so figuring obtains one hundred and twelve millions of receipts, forgetting that on May 27, 1885, in the company's letter to the Minister of the Interior, it had fixed the transit at *four millions tons* only, for a *tide-level canal entirely finished*.

According to the *Bulletin* of December 16, 1887, page 1910, the provisional canal is to be but 4 metres 57 centimetres deep; thus not a *single* ship will be able to pass, as in the tenth *Bulletin* of the Suez Canal of the 22d of December last it was stated the ships that go through Suez have a minimum draft of 7 metres. Therefore, without sufficient depth, no traffic is possible.

WORKMEN.

Extract from M. F. de Lesseps' letter of November 15, 1887.

"It was possible to execute the work in eight years by doubling the plant, which was done; this plant, collectively corresponding to a group of 30,000 to 40,000 workmen. I was in hopes that the contractors would obtain that number."

Bulletin, February 1, 1881, page 315: "Orders are already prepared for the construction of steam engines by means of which we will not have to employ *more than 8,000 day laborers*." (Meeting of January 31, 1881.)

Bulletin, July 15, 1880, page 210: "*Six years will be sufficient to accomplish the work, viz., 1,500 days, counting 250 days per annum; 50,000 cubic metres* per day*

* One cubic metre equals 1.31 cubic yard.

with 8,000 workmen, the machines and the necessary motive power."—(F. de Lesseps.)

Bulletin, March 4, 1881, page 333: "The execution of this programme will not require more than 8,000 to 10,000 workmen, during the most active period of the work."—(General Meeting, March 3, 1881.)

Bulletin, December 15, 1883, page 905: "*Recruiting workmen is extremely easy. In a short time the company will have 15,000 laborers and this number could easily be carried to 20,000, 30,000 and even 40,000.*"

Bulletin, April 15, 1886, page 1,479: "57,000 horsepower, that is, 574,000 men of iron and steel, without counting those of flesh and bone! What a manifestation of human power!"

Bulletin, May 1, 1886, page 1491: "M. de Molinari, correspondent of the *Débats*, a man of great worth, very competent, very calm, an experienced judge, has calculated that the machines for performing the work represent the laboring power of 500,000 men."

Until 1886, the company had stated and repeated that workmen were abundant and there was no lack of them; but it now pretends that its work-yards are deserted. Could it be that notwithstanding the climate, which, according to the company, is a very healthy one, the workmen are dead?

To sum up, the company at the start asked for 8,000 workmen at the most, to dig in six years a tide-level canal, and for a long time it has possessed 574,000 men of iron and steel, without counting those of flesh and bone.

It complains nevertheless, and declares that it cannot finish its canal for want of workmen. Whose fault is it?

VARIOUS OPENING DATES ACCORDING TO THE COMPANY.

Extract from M. de Lesseps' letter of November 15, 1887. *We admit that the inauguration cannot take place before the first days of 1890 (read February 3d, 1890).*

This date was fixed by M. de Lesseps at the Academy of Sciences, on October 31, 1887.

First, Positive Inauguration of a tide-level canal on October 1, 1887.

Bulletin, February 1, 1880, page 84: "This very day I will make an appointment to meet you at Panama seven years hence, on October first, 1887, for the inauguration of the canal, and I hope that the same deputation, composed of the same men, will keep the appointment punctually. I thank you once more for your kind wishes, and regret that I cannot shake hands with, and embrace you all."—(F. de Lesseps.)

Second Inauguration of a tide-level canal on January 1, 1888.

Bulletin, August 1, 1884, page 1041: Even though we should not commence the dry workings until January 1, 1885, and the dredging work on January 1, 1886, the canal could mathematically be completed on January first, 1888."—(General Meeting.)

Third Inauguration of a tide-level canal in 1888.

"That is what permitted me to foresee that the canal would be completed in 1888."—(Letter addressed to Mr. Philipon by M. de Lesseps, on November 6, 1883.)

Bulletin, August 1, 1885, page 1260: "The organization of the working camps, the installation along the whole line of twenty-seven contractors piercing the isthmus at their own risk and peril, an immense stock on working footing, is such as to allow the canal to be completed and inaugurated in 1888."—(Letter of May 27, 1885, from M. F. de Lesseps to the Minister of the Interior, to obtain the authorization of raising a loan of six hundred million francs on lottery bonds.)

Fourth Inauguration of a tide-level canal in April, 1889.

Bulletin, February 15, 1886, page 1404: "We will return to Europe in two months and in three years from that time our one hundred million cubic metres of earth and rocks will be extracted and the Pacific and Atlantic oceans will be united."—(F. de Lesseps.)

Fifth Inauguration of a tide-level canal on March 1, 1889.

Bulletin, April 15, 1886, page 1478: "On one of these

days, you have, by a spontaneous inspiration, fixed the date of the opening of the canal as *March first, 1889.*"

—(Speech of Bishop Thiel, of Costa Rica, to M. de Lesseps.)

Sixth Inauguration of a tide-level canal in July, 1886, at the latest.

"We reach the irrefutable conclusion that the Panama canal will be completed in July, 1889, at the latest."

Bulletin, February 1, 1886, page 1390: "For my part, I am positive that I will be able in sixty days from now, to repeat to you, authoritatively, that the work will be accomplished in the course of the year 1889."—(F. de Lesseps to the Academy of Sciences, on January 27, 1886.)

Seventh Inauguration of a tide-level canal in 1889.

Bulletin, May 1, 1886, page 1492: "After having thoroughly studied the technical question and *every inch* of the ground on the whole line of the canal As to the question of the time necessary to finish it, my father has said that it will be certainly completed in 1889; I am entirely of his opinion."—(Charles-Aimé de Lesseps, Vice-President of the company.)

First Inauguration (February 3, 1890) of an incomplete canal, provisionally of 4 metres 57 centimetres in depth, instead of 9 metres, and suddenly transformed into a lock-canal.

Company's letter of November 15, 1887:

"We admit that the inauguration of the ship-canal cannot take place until the first days of 1890." (Read February 3d.)

SUMMARY.

First positive inauguration of a tide-level canal, October 1, 1887.

Second positive inauguration of a tide-level canal, January 1, 1888.

Third positive inauguration of a tide-level canal, in 1888.

Fourth positive inauguration of a tide-level canal, April, 1889.

Fifth positive inauguration of a tide-level canal, March 1, 1889.

Sixth positive inauguration of a tide-level canal, July, 1889, at the latest.

Seventh positive inauguration of a tide-level canal, in 1889.

First inauguration of a provisional canal, not at the level, 4 metres, 57 centimetres deep, and suddenly transformed into a canal with locks, February 3, 1890.

Has the company solemnly announced seven different inauguration days? *Yes.*

Has a single inauguration taken place? *No.*

Can, therefore, the one announced for February 3, 1890, be relied upon? *No.*

What do our Honorable Senators and Deputies think of these numerous inaugurations? *

N. B.—For the depth of 4 metres 57 centimetres see the *Bulletin* of December 16, 1887, page 1910.

Singular coincidence of inauguration announcements, and loans:

In August, 1880, promise of a <i>definitive</i> inauguration, in 1887	Loan, 300 millions.
In December, 1882, promise of a <i>definitive</i> inauguration, in 1888	Loan, 109 “
In October, 1883, promise of a <i>definitive</i> and certain inauguration in 1888	Loan, 171 “
In August, 1884, promise of a <i>definitive</i> , <i>certain and mathematical</i> inauguration in 1888	Loan, 159 “
In July, 1886, promise of a <i>definitive</i> inauguration <i>within the proper limits</i> ,	Loan, 206 “
In July, 1887, promise of a <i>definite</i> inauguration, <i>with hopes of its taking place</i> in 1889	Loan, 113 “
November 15, 1877, promise of a <i>provisional</i> inauguration on February 3, 1890	Loan, 565 “

* *Panama and Suez*, Paris.

VARIOUS ESTIMATES OF THE EXCAVATIONS TO MAKE,
ACCORDING TO THE COMPANY.

I can now understand why the Panama Company announces so frequently the completion of its canal, and why it never inaugurates it.

First, 46,150,000 cubic metres, *Bulletin*, October 1, 1879, page 19.

Second, 72,986,000 cubic metres, *Bulletin*, September 15, 1879.

Third, 75,000,000 cubic metres, *Bulletin*, July 15, 1880, page 210.

Fourth, 99,391,000 cubic metres, *Bulletin*, June 15, 1883, page 784.

Fifth, 100,000,000 cubic metres, letter from M. F. de Lesseps to Mr. Philipon, November 6, 1883.

Sixth, 102,000,000 cubic metres, *Bulletin*, May 1, 1884, page 982.

Seventh, 110,000,000 cubic metres, *Bulletin*, August 1, 1884, page 1037 (General Meeting).

Eighth, 135,000,000 cubic metres, of which 25,000,000 are already removed and 110,000,000 still to be removed. *Bulletin*, July 22, 1887, page 1813.

161,000,000 cubic metres, according to Mr. Tanco Armero, agent of the Colombian Government, to the Canal Company (Report of 1887).

In June, 1887, the company had removed 37,000,000 cubic metres and spent nearly a thousand million francs. It is evident that the company will never find enough money to remove the 110,000,000 cubic metres, at least, still to be excavated to terminate the tide-level canal.

The tide-level canal, still spoken of to the public, is therefore nothing more than a chimera.

IMPOSSIBILITIES IN THE WAY OF INAUGURATING, ON JANUARY 3, 1890, THE PARTIAL, PROVISIONAL LOCK-CANAL.

Extract from M. de Lesseps' letter of November 15, 1887. "We admit that the inauguration of the ship-

canal may not take place until the first months of 1890," (February 3).

"This scheme only leaves 40,000,000 cubic metres to excavate, of which 10,000,000 of hard ground (read rock) and 30,000,000 of dredgable ground. These reduced extractions are materially assured"

FIRST IMPOSSIBILITY.

By whom and how are these extractions assured?

Accepting as correct the figures given of 40,000,000 cubic metres, figures which are probably as exact as the eight different estimates previously furnished by the company (see the chapter on Excavations, page 3), let us see whether it is possible to remove them in two years.

Bulletin, April 1, 1886, page 1439: "We have passed the period of groping and can now go straight ahead."

"At the end of the year 1886, we will make a considerable jump and will succeed in extracting three million cubic metres a month."—(F. de Lesseps.)

The year 1887 is gone, and the excavations which were to be 3,000,000 metres a month could not reach an average of one million a month.

In two years, June, 1885, to June, 1887, with work-yards thoroughly organized and 574,000 men of iron and steel without counting those of flesh and bone, the company has extracted 22,188,000 cubic metres, and nearly all of that in slime and sand, and now that its work-yards are disorganized and short of laborers, that its machines are partly worn out (see *Bulletins* of 1887, and especially that of September 16, last), it pretends that in the same space of time it will excavate 40,000,000, that is to say, double the quantity. It is also well to say that since last August the extraction has been so light that the company has not dared publish the figures.

It is true that M. F. de Lesseps spoke during the spring of 1887 of carrying on the work night and day; but this was immediately received as utopian, as many of the dredges and excavators were inactive even in the daytime from lack of hands.

To further demonstrate the impossibility of extracting 40,000,000 cubic metres in two years, it will be sufficient to recall what the company itself published in its *Bulletin* of December 1, 1879, page 51, concerning the Nicaragua Canal.

"Six years in which to do everything, gates, locks, dams, bridges, trenches, dredgings, etc., besides 60,000,000 to 70,000,000 cubic metres of excavations, *would have been the consummation of activity.*"

"The full commission was obliged to cast votes to make the limit eight years."

The Panama Company has about the same amount of work to perform. Should it therefore accomplish this task in two years only, it would be the culmination of activity.

In order to raise again the shaken confidence of its adherents, the company announces in its *Bulletin* of December 2, 1887, that the total length of the canal already in water is twenty-five kilometres. That is possible, but these twenty-five kilometres neither have the width nor the depth required for large ships. Furthermore, these twenty-five kilometres, being in the lower regions, composed of slime and light soil, have been easy to excavate. This will not be the case in the mountainous region of the Culebra where the celebrated Dutch contractors, who were to remove 610,000 cubic metres per month, only extracted 50,000, and finally abandoned the work.

We have here a real obstacle, which the company can never remove in two years.

Moreover, in the *Bulletin* of December 16 last, page 1910, we read, in bold type, a competent opinion: "The locks will be temporary and the work will be pushed vigorously after the road will be opened to ships gauging 4 metres, 57 centimetres. According to my judgment, ships will cross in three years from next January 1 (1888)."

According to this competent opinion of Mr. Slaven, one of the largest contractors in the company, the canal would only be opened in January, 1891, and not in

January, 1890, and then with a depth of 4 metres, 57 centimetres; that is to say, insufficient for the passage of ships which draw at least 7 metres of water, as the *Bulletin* of the Suez Canal, of December 22, 1887, declares.

SECOND IMPOSSIBILITY.

Messrs. Dirks and Conrad, chief engineers of the Waterstaat in Holland, considered at the congress of 1879 to be the most competent on construction of locks, both declared that it would require at least six years to build only two locks. (See report of the meetings of the congress, page 569.)

It is therefore impossible that the eight locks necessary for the Panama Canal be manufactured in France, transported to and set up in America in two years only.

THIRD IMPOSSIBILITY.

A third impossibility, and not the least important in the execution of the Panama canal, consists in the nature of the material to be removed, to cross the mountainous region of the Culebra. The ground in this district is either extremely hard and consequently very difficult of extraction, or else of bad quality, and extremely given to falling in. The latter is composed of clay and sand impregnated with water, in which it is impossible to cut deep trenches without provoking formidable land slides, against which science has not as yet found an efficacious remedy. (See *Bulletin*, May 16, 1887, page 1762, downfall 910 metres in length, and page 1764, downfall so extensive at Obispo that the fallen earth could not be removed in five months.)

That is an insurmountable obstacle which learned and independent engineers did not fail to call the attention of the congress to in 1879, but of which, unfortunately, no heed was taken.

FOURTH IMPOSSIBILITY.

Bulletin, October 15, 1883, page 864: "In winter, the Chagres carries 1600 cubic metres per second, which makes it a river nearly equal to the Seine."

Bulletin, November 1, 1883, page 880: "The Chagres carries 13 cubic metres per second in summer, and it sometimes reaches 1600 cubic metres in winter. In this figure I do not include all the secondary tributaries.

"For instance, farther down the river, the Rio Trinidad gives 400 cubic metres, and the Gatuncillo as much. (Dingler, chief engineer of the company)."

This river Chagres, which runs up from 13 to 3000 cubic metres per second and consequently acquires two hundred and thirty times its usual volume in the course of a few days, will not furnish enough water in summer to supply the locks, and will carry everything away in winter. To offset this double inconvenience, the company spoke, during seven years, of constructing at Gamboa an immense reservoir of 1,000,000,000 cubic metres; but they gave up this project in 1887, recognizing that this artificial lake was impracticable.

THE EIFFEL CONTRACT.

Extract from M. de Lesseps' letter of November 15, 1887: "These reduced excavations being materially assured, we entrusted to Mr. Eiffel . . . the preparation of an estimate for the execution of the works of art."

The excavations to be made, still amounting to the enormous quantity of 40,000,000 cubic metres at least, are not at all assured, as has been seen under the heading "Impossibilities."

Concerning this passage of M. de Lesseps' letter, it is well to state that, contrary to what many newspapers have published, Mr. Eiffel has only contracted to execute the works of art (bridges and locks), estimated, it is said, at 125,000,000 francs, and no other work, such as earthworks, etc.

Consequently the Eiffel contract in no way guarantees the completion of the canal for February 3, 1890.

Let us add that Messrs. Couvreux and Hersent, the well-known contractors who had at the start signed a formal agreement to dig the whole canal at the contract price of 512,000,000 francs, did not do it. Why expect

that Mr. Eiffel, who has only undertaken to supply the gates for the locks, will complete the whole canal?

On the other hand, if the company really desires to keep the public informed, and to avoid all misunderstanding, it will hasten to publish in its bulletins, first, the terms of the Eiffel contract, then the exact plans and dimensions of its lock-canal, as well as the detailed specification with the price of each part of the work, and finally the amount of all the estimates of the work still to be performed, as it has already done so many times for its tide-level canal.

We await this interesting publication.

In order to obtain from the government the authority to raise a loan of five hundred and sixty-five million francs in lottery bonds, the company made the newspapers repeat every day that French industries were greatly interested in the continuation of the work on the Panama canal.

Outside of the furnishing of the bridges and locks, which will amount, it is said, to one hundred and twenty-five millions, the balance of the loan will serve to pay a few excavations, many general expenses and the interest, which will soon reach one hundred and fifty millions per annum.

To cause the French saving class to lose five hundred and sixty-five millions more, in order to procure one hundred and twenty-five millions of work to their industry, is such a singular idea that it could only have started in the office of the company.

Extract from F. de Lesseps' letter of November 15, 1887. Questions put by the company to the consulting commission.

(a) *Is it possible to establish, in the central mass, a summit pond which would allow of the continuation of the tide-level canal by applying the dredging process to the digging of this part?*

(b) *Will it be possible, when these dispositions are made, to open the maritime communication between the two oceans, without interrupting the work of deepening?*

At a full sitting, the commission unanimously

answered the two questions put to them in the affirmative.

These two questions and the answer, accompanied by the names of Messrs. Daubrée, the Admiral Jurien de la Graviere, Jacquet, Lalanne, Pascal, Voisin Bey, Ruelle, Laroche, Larousse, Boutan and Oppermann made a great impression upon the public; but on a close examination, it is seen that they are not serious and signify nothing whatever.

The consulting committee does unanimously answer: Yes, a pond can be established in the central mass, to continue dredging the tide-level canal; Yes, it will be possible to open the canal to navigation and yet continue to deepen it.

But every one knew that for eighteen years past the Suez Company has deepened and widened its canal without impeding navigation, and is even thinking of doubling its present proportions.

It was therefore unnecessary to disturb for a single moment the above named gentlemen, and to make the 400,000 Panama subscribers wait so long, to give them such information as that.

Here are the only and real questions which the capitalists ask the consulting commission to answer *seriously* and without delay:

First, Can the tide-level canal be achieved?

Second, How many years will the entire completion of the tide-level canal require?

Third, How much will this canal cost, all expenses included?

Fourth, When will the provisional lock-canal be completed, and how much will it cost with a depth of nine metres?

The answers to these four questions can and must be short, clear and to the point.

We hope the government will be able to obtain these answers which the company obstinately refuses to give to its 400,000 lenders.*

* *Panama and Suez, Paris.*

When it was established, the company was to achieve a superb tide-level canal for six hundred millions, then for one thousand and seventy millions; it now proposes to furnish a *provisional lock-canal* with a depth of 4 metres, 57 centimetres, instead of 9 metres, for the colossal sum of one thousand and six hundred and fifty-four millions.

Let us now see what the company still thinks of lock-canals:

Bulletin, November 15, 1879, page 43: "*I will never give my adhesion, (says M. de Lesseps,) on account of the experience with the Suez Canal, to a project with locks.*"

Bulletin, November 15, 1878, page 46: "The Panama has no locks. The Nicaragua has many: this is why the *intelligent* men of the congress of Paris adopted the Panama."—(F. de Lesseps.)

Mr. Eiffel, the great builder, now so highly praised by the company, was present at the congress and voted against the *intelligent* men.

Bulletin, December 15, 1879, pages 58 and 59: "*An annual traffic of 6,000,000 tons is only possible in a canal capable of allowing fifty ships to pass in one day. It is this necessity which caused the adoption, for the piercing of Suez, of a tide-level canal without locks . . .*

"An interoceanic canal with a single obstacle on its line, would not satisfy a traffic of 6,000,000 tons."—(Marius Fontane, manager of the Panama Company.)

How can the company, after these positive statements, now declare that it will admit of a traffic of 7,500,000 tons through a *provisional canal with locks*?

Bulletin, February 1, 1880, page 86: "M. de Lesseps declares that he is in favor of a tide-level canal as adopted by the Paris congress; it is the only *practicable* project, says he, and I will execute it."

According to F. de Lesseps, a *provisional lock-canal* will therefore be impracticable.

Bulletin, April 1, 1886, page 122: "The second difficulty has also disappeared. There is not a man, *jealous of his dignity as engineer, sailor or economist*, who would now dare say that a canal with obstacles is desir-

able."—(Marius Fontane, manager of the Panama Company.)

Contrary to this opinion, Mr. Eiffel, whom the company now praises so highly, was present at the congress and declared that a lock-canal was preferable to a tide-level one.

Bulletin, May 1, 1880, page 156: "M. de Lesseps declares that a canal without obstacles is the only one that can accommodate ocean vessels and the present great navigation."

It must be concluded from this that a temporary canal with obstacles, that is to say locks, will not accommodate the great navigation.

Bulletin, May 15, 1880, page 161: "There are no locks," says M. de Lesseps, "that cope at the present time with the transit of the vessels which go through Suez."

It is necessary to call attention to the fact that when M. de Lesseps spoke in these terms the traffic of Suez only amounted to 3,057,421 tons. If a completed lock-canal 9 metres deep cannot, according to M. de Lesseps in 1880, prove sufficient for a traffic of 3,000,000 tons, how can 7,500,000 tons be carried through Panama with a provisional canal 4 metres, 57 centimetres deep, and with locks?

Bulletin, January 1, 1881, page 298: "It is so superabundantly demonstrated by all studies, that lock-canals cannot accommodate large ships that it is unnecessary for us to return to this subject."

Bulletin, November 1, 1881, page 461: "The demonstration having been made that a canal with obstacles, be it but a single lock, could not give passage to a sufficient number of ships to remunerate the capital employed in its construction."

Bulletin, April 15, 1885, page 1170: "A single lock out of order would be sufficient to arrest all navigation for two months."

Bulletin, January 1, 1886, page 1369: "I answered them that I could not give my attention to a project for a lock-canal, as I considered this system absolutely contrary to the principles of maritime communication be-

tween two seas."—(F. de Lesseps to the Geographical Society.)

Report of the meetings of the congress of 1879, page 649: "M. Marius Fontane, manager of the Panama Company: I vote yes, because the canal with a constant level is the only one that can assure a constant revenue for the capital engaged in the enterprise."

If the lock-canal estimated at five hundred and seventy million francs by the congress could not pay, is it evident that the canal now proposed by the company, a partial canal 4 metres 57 centimetres deep, with many locks and costing one thousand six hundred and fifty-four millions will prove a disastrous affair?

To sum up, M. de Lesseps and his advisers promised us a magnificent tide-level canal nine metres deep, for six hundred millions. They have declared, many and many a time, that a lock-canal entirely achieved, was absolutely contrary to the principles of maritime navigation, that it would not pay its shareholders and that it would be impracticable.

After squandering a thousand millions in unnecessary work, these same men now come forward and say to the French government: Authorize us to borrow five hundred and sixty-five millions more, on lottery bonds, and we will endeavor to furnish, for the one thousand, six hundred and fifty-four millions received by us (see debts of the company), a temporary lock-canal 4 metres 57 centimetres in depth, instead of the 9 metre tide-level canal which we promised to the whole world, during eight years.

From the above we must come to the conclusion that the thousand millions spent up to this date have been badly employed and that they are entirely lost to the French economizers.

Extract from M. de Lesseps' letter of November 15, 1887: "7,500,000 tons at the rate of fifteen francs."

In the Suez Canal, which is at tide-level, M. de Lesseps, notwithstanding the continual protests of the shareholders and of the defence committee, wants to reduce to five francs per ton the ten francs rate stipulated in

the act of concession, under the pretext that this rate is too high; but in the Panama canal, which will be unfinished, provisional and with locks, with a depth of only 4 metres 57 centimetres, the same M. de Lesseps intends to apply a rate of fifteen francs.

How does the Suez management, which is the same for Panama, find bad for the Egyptian canal that which is good for the American one?

Strange mystery!

Extract from M. de Lesseps' letter of November 15, 1837: "In its estimate of the total expenses, the international congress had calculated that the loans would cost five per cent."

The company should not be astonished at having to pay a high price for the money it borrows, as until 1885 it promised to supply in 1888 and even in 1887 a tide-level canal completely finished for six hundred millions, all expenses included.

As the affair appeared a good one, at that price, the public gladly loaned its money at five per cent.

But, from 1885, the company asks one thousand and seventy millions for the same canal. The investment becoming doubtful, the capitalists asked ten per cent.

The company now speaks of executing a partial, provisional, impracticable lock-canal that will not pay, the cost of which will reach the fabulous amount of one thousand, six hundred and fifty-four millions at least.

Under such conditions, the affair becoming disastrous, no one will want to give a cent and it will not be more than fair.

The most surprising part of all this is the astonishment of the company.

Extract from M. F. de Lesseps' letter of November 15, 1837:

"Grand total of the cost of the canal on the opening day in 1890 everything included: one thousand, five hundred million francs."

The following are the sums received:

600,000 shares	at	500 francs,	300,000,000 fr.
250,000 5 per cent. bonds	"	437.50 "	109,375,000 fr.
600,000 3	"	285 "	171,000,000 fr.
477,000 4	"	333 "	158,969,871 fr.
458,802 6	"	450 "	206,460,900 fr.
256,887 6	"	440 "	113,910,280 fr.
Proceeds of temporary investments and revenue of the railroad, at least			30,000,000 fr.
Total.....			1,089,716,051 fr.
Loan now solicited.....			565,000,000 fr.
Grand total.....			1,654,716,051 fr.

This total of expenses made or to be made, will correspond to a reimbursable capital of about two thousand, five hundred millions.

The company is therefore making a great mistake in giving only one thousand, five hundred millions.

MAXIMUM RECEIPTS AND MINIMUM EXPENSES AFTER THE OPENING OF THE LOCK-CANAL.

Extract from the letter of November 15, 1887.

"The receipts alone from the toll for transit of the 7,500,000 tons: 112,500,000 francs."

As was already seen in the *Bulletin* of May 15, 1880, page 161, a lock-canal, even a definitive one, would prove insufficient for a transit of three million tons; and, supposing that, contrary to probabilities, the Panama managers (who are at the same time the Suez managers), maintain the toll at fifteen francs at Panama, whilst insisting upon reducing it to five francs at Suez, and obtain the following figures:

RECEIPTS.

A maximum of 3,000,000 tons at 15 francs..... 45,000,000 fr.

EXPENSES.

Management, as per letter of Nov. 15, 1887.....	5,000,000 fr.
Unforeseen expenses.....	4,000,000 fr.
Carried forward.....	<u>9,000,000 fr.</u>

Brought forward.....	9,000,000 fr.
Maintenance, according to the congress.....	6,500,000 fr.
5 per cent. of the gross receipts to the Colombian government	2,250,000 fr.

According to Inventory of '86.	Commissions.....	3,000,000 fr.
	Interest on the 600,000 shares.....	15,000,000 fr.
	Interest on 5 per cent. bonds.....	6,227,000 fr.
	Sinking Fund.....	180,500 fr.
	Interest on 4 per cent. bonds.....	7,314,620 fr.
	Sinking Fund.....	422,500 fr.
	Interest on 3 per cent. bonds.....	8,975,580 fr.
	Sinking Fund.....	1,104,500 fr.
	Interest on 5 per cent. bonds, 1st series....	13,764,406 fr.
	Sinking Fund.....	6,000,000 fr.
	Interest on 6 per cent. bonds, 2d series....	7,766,610 fr.
	Sinking Fund.....	3,000,000 fr.

Interest and Sinking Fund of the 565,000,000 loan now applied for.....	56,500,000 fr.
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Total of expenses, interest and sinking fund, 147,005,716 fr.

These are exact, official and undeniable figures, whereas those given by the company are incorrect and fanciful. For instance, the company counts upon a commission of 6 per cent. for the handling of its securities, whereas it costs from 8 to 10 per cent.

On the other hand, any discussion at the present time concerning the receipts is a waste of time, as the canal, with only a depth of 4 metres, 57 centimetres as projected, will not allow of the passage of a single ship. (See estimated traffic.) Therefore, no depth, no traffic, no receipts, no revenue, but on the other hand the 147,000,000 francs of expenses detailed above will have to be paid every year.

SINGULAR PRETENSIONS OF M. DE LESSEPS.

Extract from M. de Lesseps' letter of November 15, 1887:

"It now rests entirely upon the government of the Republic . . . to definitely assure the performance of our programme."

To speak as above, has the company forgotten its bold and manly declarations of former times? Here are some of them:

Bulletin, March 15, 1880, page 113: M. F. de Lesseps declared that the canal of the Isthmus of Panama can and should be constructed, and he added that he staked his reputation, past and future, on the success of the enterprise.—(M. de Lesseps to the Geographical Society of New York.)

Bulletin, June 15, 1880, page 193: "M. F. de Lesseps declared that he had accepted the direction of the cutting of the Isthmus, but that he had assumed the entire responsibility, as becomes a general-in-chief."

"When I was still a young man in Egypt, that great man Mehemet Ali, gave me this advice which I have always followed: '*M. de Lesseps, remember that when two men put themselves at the head of an enterprise, there is always one too many.*'"—(F. de Lesseps at Amiens.)

Bulletin, April 15, 1885, page 1190: "It must be said that the canal is finished."—(Letter from Victor de Lesseps to his father, F. de Lesseps.)

Bulletin, July 15, 1886, page 1558: "I am put off. I accept no adjournment. Faithful to my past, when persons endeavor to stop me, I go straight ahead, certainly not alone, but with 350,000 Frenchmen sharing my patriotic confidence."—(Letter from F. de Lesseps to the shareholders and correspondents of the company, after the petition made in 1885 to the Government for permission to raise a loan of six hundred millions on lottery bonds, which petition was withdrawn because the company refused to exhibit its contracts.)

From all the citations which appear in this work, it is evident that the company is alone obliged to finish the canal and not the Government.

There yet remain over 100,000,000 cubic metres to remove, the derivation ports and locks to make. In a word sufficient for at least three thousand million francs of work.

CONTRACTORS.

Extract from a letter of date November 15, 1887: "I hold subject to your orders all the documents and contracts."

Bulletin, February 1, 1881, page 315: "Acceptation by Messrs. Couvreux and Hersent of the contract for the total work on a revised specification of five hundred and twelve millions.—(General Meeting, January 31, 1881.)

Letter from F. de Lesseps to the Minister of the Interior, dated May 27, 1885:

"The installation along the whole line, from one ocean to the other, of twenty contractors cutting the Isthmus at their risk and peril."

Bulletin, August 1, 1885, page 1259: "The contracts signed with two contractors who have undertaken to hand over a completed canal, cut to its floor, enable us to give the expense of finishing the work."—(Meeting of July 29, 1885.)

All the bulletins are full of names of many contractors, but it is unnecessary to cite them all.

On May 27, 1885, the company which refused to show its contracts, now places them at the disposal of the ministers.

If the three series of contractors cited above had kept all their engagements, the company would have been able to make three canals instead of one.

Bulletin, September 1, 1879: Circular to the correspondents of the Universal Canal Company, to the founders and the subscribers: "The issue of 800,000 shares which took place in Europe and America on April 7th and 8th, 1879, has not been covered. . . . The arguments of the opposition can be summed up as follows: on one hand figures were presented of exaggerated expenses and of insufficient receipts in order to show that the speculation would be a bad one. . . . To the first argument, the able contractor, Mr. Couvreux, and his partners, . . . have agreed to take charge of its execution at the company's orders or on contract."—(F. de Lesseps.)

Why did the company cancel this contract, signed with rich contractors, and which absolutely guaranteed the entire execution of the canal for five hundred and twelve millions, whether the contracting firm gained or lost, as the report informed the meeting on January 31, 1888 ?

Why did it, furthermore, pay these contractors an indemnity of 1,200,000 francs ?

That is the question !

It is evident that these contracts were not of a serious nature since the canal is not made, although not six hundred millions but a thousand millions have been already spent.

Report of the meetings of the congress of 1879, page 639: "At the preceding sessions, our honorable president (M. F. de Lesseps) said that, in this affair, the assistance of the government should not be resorted to and that we must call on the public only."

Bulletin, February 15, 1881, page 324: "The French government has declared over and over again that, officially, France has no interest in the canal."

Bulletin, August 1, 1882: "The American public was pleased to learn that in the same report, M. de Lesseps reiterated the assurance that the company had *never asked for the assistance of the French government, as had been falsely announced, and which would have wounded the feelings of the Americans.*"

Bulletin, July 17, 1884: "*For my part, I desire to declare in the most positive manner that the Panama Canal Company will carry on and finish its work without the assistance of any government whatsoever, this being a purely private enterprise.*"—(F. de Lesseps.)

After making such formal and solemn pledges, how can the company now ask the assistance of the French government ?

Bulletin, April 1, 1880, page 137: Message of Mr. Hayes, President of the United States: "The policy of this country is for a canal under *American control. The United States could not consent to leave this control to any European power. . . . No European power can*

step in for such protection without adopting measures which the United States would consider totally inadmissible."

Bulletin, November 1, 1881, page 457: Circular of Mr. Blaine, Assistant Secretary of State of the United States:

"The United States would consider an unwarrantable interference any step taken by European governments with a view of giving a supplementary guarantee to an enterprise in which the local and general interests of America must take precedence over those of all other countries."

Bulletin, December 1, 1881, page 479: Speech of Mr. G. Maney, Minister of the United States to the President of the United States of Colombia: "America for the Americans."

Bulletin, December 15, 1881, page 482: Message of President Arthur:

"Meanwhile, the United States of Colombia asked the European powers to guarantee on their part the neutrality of the canal, which was in direct opposition to the rights of America, which is the sole warrantor of the integrity of Colombia and of the canal. . . .

"My predecessor had thought it his duty to submit to the European powers the reasons which rendered our guarantee indispensable, for which reason the interposition of any foreign guarantee whatsoever might be regarded as a superfluous and unfriendly act."

It is unnecessary to insist upon the importance of these citations. It is evident that any intervention whatever in the affairs of the company would surely bring about complications with the United States of America.

Extract from the letter of November 15, 1887: "In view of the unqualified and stubborn animosity of adversaries, whom the liberality of our laws protect. . . ."

The complaints of the company are absolutely groundless, but they prove that it needs to excuse its incapacity by accusing somebody.

Where are these threatening opponents the company

speaks of, and how can it complain after publishing the following words in the *Bulletin*, of September 15, 1884, page 10671

"I love opposition. Adversaries are monitors who cost nothing."—(Ferdinand de Lesseps.)

Now, although the company has devoured a thousand millions without digging the proposed canal, not a single important paper attacks it; it is true that the press has nearly ceased praising and applauding, but this silence alone frightens the company.

The company begins to fear the complaints and re-creminations of its 400,000 unfortunate subscribers.

It is the immense responsibility assumed during the last eight years which gives it the mania of persecution.

At the general meetings, the company does not allow the making of a single remark, and any shareholder who is daring enough to stammer a word is immediately hooted and hustled like a traitor.

At the congress of 1879, the Americans, who are a practical people, declared that after ten years of studies on the Isthmus, they had recognized that a tide-level canal between Colon and Panama was impracticable.

At the same congress, nearly all the engineers, among them Mr. Levalley, a friend of M. De Lesseps, and Mr. Eiffel, the celebrated contractor, were opposed to a tide-level canal, frightened as they were by the unconquerable difficulties, such as the deep cutting of the Culebra, the floodings of the uncontrollable Chagres River, the bottomless marshes of Colon and the unhealthfulness of the climate.

The company disregarded these wise counsels, emanating from competent men, and now it accuses invisible enemies so as not to admit that it has failed.

Let it be well understood that the real and only implacable enemy of the enterprise is the company itself, which has always promised much but has never done anything.

Letter of November 15, 1887.

On the whole, the letter written on November 15, 1887, by M. F. de Lesseps, and addressed to the Prime Minis-

ter, is cleverly written; but it is a jumble of *reticencés*, of obscure phrases and erroneous figures which throw no light upon the Panama canal, and which cannot for a moment stand discussion.

It is not upon such data that a government can authorize a company that has already spent so much money, to borrow five hundred and sixty-five millions more.

Usually, one says: the past speaks for the future. The company has squandered a thousand millions in unnecessary work; it will peaceably continue to borrow much and to perform little and await a European complication or some unforeseen event, such, for instance, as the death of its president, M. de Lesseps.

The Colombian government has gratuitously given 500,000 hectares* of ground to the company, which makes a great show of this fact, whenever it needs money.

Then how much are the 500,000 hectares of ground worth, of which the company speaks so much?

The United States of Colombia cover an area of 133,000,000 hectares, or about three times the surface of France. The population amounts to about 3,000,000 inhabitants, who cultivate less than 3,000,000 hectares.

The 130,000,000 uncultivated hectares are called free lands, which means, lands at the disposal of the first occupier who is willing to have them cultivated, and to whom, according to law, they regularly belong after five years. Therefore, any one can take possession of the said 130,000,000 hectares, and the government will even offer, as a bonus, to pay his travelling expenses from Colon or Panama to his destination. (For further information, read the *Bulletin* of September 15, 1880, page 244 and following pages.)

The company's 500,000 hectares are therefore worth absolutely nothing.

"Last year we asked why the company gave one mill-

* One hectare equals 2.471143 acres.

ion five hundred thousand francs every year to an American committee.

"Since the company continues to remain silent, we shall inform our readers. We have discovered (*Bulletin*, February 1, 1881, page 316), that the New York Committee represented the interests of the company in the United States of America, in all that concerns the neutrality of the canal.

"The report presented to the second general meeting (*Bulletin* of March 4, 1881), further informed us that this famous committee costs the company twelve million francs, paid in seven installments. Mr. Thompson, ex-Secretary of the United States Navy, is president of the said committee.

"It is really distressing to think that this enormous sum, amassed with so much trouble by thousands of Frenchmen, should be given to four or five Americans for the performance of such little work.

"At the inventory of June, 1884, the company made an entry of ten million, two hundred and sixty-seven thousand, eight hundred and forty-one francs commissions for the annual handling of the securities. In 1885, a sum nearly equal appears in the accounts.

"In May, 1887, we protested against this exorbitant expense, and in the following statement presented at the meeting of July 21 last, these expenses suddenly fell to two million, eight hundred and forty-four thousand, one hundred and twenty-one francs, although the number of securities had been nearly doubled."*

It is evident that criticism is good, when it can cause a saving of about seven millions a year on one item alone.

At the statement presented to the meeting of July 21, 1887, the company estimates the value of its building, No. 46 Rue Caumartin, at one million, eight hundred and sixty-five thousand, six hundred and twenty-five francs, and, contrary to general principles, the older the building gets and the more it becomes

* *Suez and Panama, Paris.*

deteriorated, the greater the price set upon it by the company. (See this extraordinary fact on the statements.)

Shareholders! Go, see, appraise, and tell me whether that dirty, narrow, low hovel, built of bad stone, is worth two millions. This structure, pompously called "mansion," has no value. The ground would sell for hardly a quarter of the estimated amount, because it is narrow (16 metres front) and all in depth.

That, good capitalists, is the way in which the company throws your savings to the winds. On seeing such prodigalities, one immediately recognizes that the managers do not pay for their extravagance out of their own pockets.

The intelligent public gazes calmly at the inordinate variations in the rise and fall of the Panama securities. It is certainly not the passionate speculation which exists on these securities which will finish the canal. The announcement of the actual excavation of four to five million cubic metres per month would be of more value to the real shareholders than a rise of 100 francs per share in a single day.

The shares issued at:

500 francs are worth	320,	loss	180 fr.
The bonds			
3% issued at 285 fr. are worth	170,	loss	115 fr.
4% issued at 333 fr. are worth	200,	loss	133 fr.
5% issued at 437 fr. are worth	280,	loss	157 fr.
6% issued at 450 fr. are worth	370,	loss	80 fr.

This is the result of the vain promises of M. de Lesseps.

While the Panama shareholders and bondholders are mentally speculating day and night whether the canal will be accomplished or not, the fortunate organizers spend the time counting the millions they have realized on the affair.

As a fact, these gentlemen have probably received at least fifty-four millions from the 9,000 parts of founders' shares which they must have sold at a minimum average of 6,000 francs each, and this without disbursing a

cent, seeing that the company paid all their expenses and advances estimated at two millions. (See second general meeting, March 3, 1881.)

Some persons pretend that France will lose its prestige in America if the Panama canal is not completed. This theory may lead one very far. If the State were obliged to see to the favorable accomplishment of the enterprises entered into abroad by its citizens, the whole capital of the country would prove insufficient. No, fortunately, the prestige of France is not bound to the very uncertain fortunes of a private corporation like that of the Panama canal.

In this purely private affair, M. de Lesseps, his board of directors and his consulting commission, who promised to establish a tide-level canal for six hundred millions, then for one thousand and seventy millions, will be the only ones that will have to render accounts to the 400,000 fanatics who will have followed them blindly.

If the government authorizes a first issue of lottery bonds, it will be caught as in a cog wheel, and will be forced to complete the canal, cost what it may.

After spending the first six hundred millions, it would have been preferable to stop there; the company willed otherwise. It is yet better to lose a thousand millions than two or three thousand millions.

This is the truth.

La Estrella de Panama, a newspaper often mentioned in the company's *Bulletins* published, on November 5th, last, a report presented in 1887 to the Colombian Minister of Finance by Mr. Nicolas Tanco Armero, inspector of the Panama Railroad and agent of the Colombian government, to the Universal Interoceanic Canal Company. This report confirms what we have said, in every respect, and is even more pessimistic than ourselves. Here are a few extracts from it:

"The total excavations to make for the canal and the derivations amounted to 161,000,000 cubic metres, and 127,000,000 cubic metres still remained undone in August last It may be assured that until now eight-tenths of the extractions were vegetable earth At

Colon and Gatun there are only calcareous deposits, brought there by the Chagres River, but the Mamei, Gorgona, Corrozal and Paraiso sections are of rocky formation and the Culebra Mountain is hard rock According to the specifications of an engineer, it will cost four hundred and seventy-one millions to regulate the Chagres River, including the Gamboa dam, and four hundred and seventy-one millions to remove the 127,000,000 cubic metres, making a total of over four thousand millions The truth is that all the work-yards are nearly deserted Let not the company say that funds have been wanting, for it has been amply supplied, but it has not used them properly At present, no one can form an idea, however remote, of the date upon which the canal will be terminated The Canal Company paid twelve hundred and fifty francs for each share of the railroad, when these shares were quoted at barely four hundred francs The Railroad Company evidently made sixty-eight millions there, of which half should belong to the United States of Colombia, according to the terms of the concession; but, up to now, the government has not received a cent. . . . The Canal Company should pay this amount according to the deed of concession.

"Equity and justice are universal laws or principles, and, sooner or later, one company or another will have to satisfy this sacred obligation to our government The financial situation of the enterprise is extremely serious, embarrassing and alarming One thing is evident, and that is that, with the system which has been followed and the manner in which the work progresses, the canal will not be completed in ten years even admitting the elimination of very necessary work and the construction of a canal with sluices and dams it is certain that the canal will not be opened even in 1892, *the year in which the concession ceases, and the government should be prepared for this contingency.*"

This report has been reproduced by the *New York Herald* and many other foreign papers. Why does the French Press, with the exception of the *Economiste*

Français of December 3d last, keep silent regarding this crushing document, to which the company must reply without delay !

On May 27, 1885, the Panama Canal Company asked, from the French government, permission to borrow six hundred millions on lottery bonds. This petition was not presented to the House of Deputies until June, 1886, when a commission of eleven members was appointed; ten of them opposed to granting the requested authorization.

At that time, the Honorable M. Sadi Carnot, Minister of Finance, being entirely opposed to the company's request, refused to support it, as can be seen by his declaration to the commission (see the *Temps* of July 4, 1886). "In reply to the formal questions of various members of the commission, M. Sadi Carnot declared that for his part, he would not go to the tribune to support the projected law, because it would give the affair a guarantee which it should not receive."

"M. Salis then asked why, in such case, the commission should assume a responsibility which the government refuses to assume.

"In its letter of May 27, 1885, to the Minister of the Interior, the company promised to complete a tide-level canal with a loan of six hundred millions of lottery bonds.

"After squandering nearly five hundred millions since then, the company asks for five hundred and sixty-five millions more to furnish a temporary lock-canal, four and a half metres deep, instead of nine metres.

"We feel satisfied that M. Sadi Carnot, President of the Republic, will be still more prudent than M. Sadi Carnot, Minister of Finance, and that he will use all his influence to prevent France from granting this year, to a private and universal company, a support which would not only make our country lose the five hundred and sixty-five millions asked, but would also bring about a conflict with the United States of America, as is proven by the documents published by the company

itself and reproduced in this work under the heading: 'Neutrality of the Canal and the United States of America.' "

To the company's unexpected letter, the Ministers of the Republic, will, no doubt, reply as follows:

"Your letter of November 15, 1887, is but a second edition of the one dated May 27, 1885, with a few variations.

"For instance, you change the year of the inauguration (1890 instead of 1888).

"You were then to make a tide-level canal and finish it entirely for one thousand and seventy millions; you now propose, for one thousand, six hundred and fifty-four millions, to furnish a partial, temporary and impracticable canal that cannot pay.

"You are now asking for another loan of five hundred and sixty-five millions to continue the temporary lock-canal, when this sum, added to the funds already collected by you, makes one thousand, six hundred and fifty-four millions, a total sufficient, according to your statements, to dig and terminate two canals, one at tide-level and the other with locks.

"You are publishing at present an unanimous opinion of your superior consulting commission; unfortunately, this document means absolutely nothing, as it neither indicates the cost of the canal nor the date of its inauguration, and is supported by no demonstrative argument.

"Can your consulting commission be, perchance, the same one that has, for seven years, approved by its silence your numerous fantastic estimates and your eight different inaugurations?

"In your letter of May 27, 1885, to the Minister of the Interior, you estimated the traffic of your tide-level canal at 4,000,000 tons; on November 15, 1887, in your letter to the Prime Minister, you speak of 7,500,000 tons for a temporary lock-canal, after declaring on May 15, 1880, that 3,000,000 tons could not pass through such a canal.

"Two and a half years ago, you affirmed that six hun-

dred millions would be sufficient to complete a tide-level canal. After spending nearly five hundred millions since that date (May 27, 1885) you ask six hundred millions more, making eleven hundred millions to furnish only a provisional lock-canal.

"You now offer to show your contracts, although you refused to do so on July 9, 1886, in the following heroic terms: *I am put off, I will accept no adjournment. Faithful to my past, when persons endeavor to stop me, I keep straight ahead! Certainly not alone, but with 350,000 Frenchmen sharing my patriotic confidence!*

"Being no doubt abandoned by your 350,000 adherents and forgetting your noble words of 1886, you now implore a second time for the intervention of the state, adding that it alone must complete the canal.

"During six years you declared to the world, in the most positive manner, that your company was universal, that it would finish the work without the assistance of any government whatever, and that France had no official connection with the canal.

"After such declarations, you should, like good patriots, cease to solicit with such persistence our intervention, which would certainly bring on a conflict with our sister, the great American Republic.

"In 1879 and 1880, you affirmed that a completed lock-canal costing five hundred and seventy millions would prove a disastrous affair: how can you now declare that a provisional lock-canal costing one thousand, six hundred and fifty-four millions will be remunerative?

"As a guarantee of the completion of the canal, you make more promises, but, for seven years, you have made so many and such fine ones, you have announced so many inaugurations which have never taken place, that it is impossible to believe in that of February 3, 1890.

"Finally, we cannot authorize you to borrow five hundred and sixty-five millions on lottery bonds to execute work in the United States of Colombia, when we refuse this favor for enterprises in France, where our unfortunate population is already suffering so much from the industrial, commercial and agricultural crisis.

"Now, you must admit that the capitalists who continue to supply you with funds after all the contradictions, inexact figures and the fantastic plans and estimates which you have published, are really too good and too credulous; admit, also, that the French government and the speculators have nothing to do with your mortifications and your unsuccessfulness, for which you alone are responsible."

If, notwithstanding the publication of these numerous official documents, capitalists continue to delude themselves, to be contented with ambiguous phrases and vague but sonorous promises, and persist in bringing their funds to Messrs. de Lesseps, father and son, who are not engineers, and to the managers, let it be at their own risk and peril, but the government must not encourage all these fanatics to give their money by the allurements of large prizes.

In telling the truth and nothing but the truth, concerning the Panama canal, I feel that I am acting as a good citizen.

For seven years past, the French press praises and upholds the Panama Canal Company and constantly refuses to publish any other information than that furnished by the company itself.

It seems to me that the time has now come when the truth should be made known concerning this unfortunate enterprise, and I hope that the newspapers that have the interest of the public at heart will make it their duty to reproduce part or all of this work, which is established from undeniable official documents.

Seeing that union is strength, shareholders, large and small, should go together to the next meeting to demand from the Board of Directors clear and distinct answers to the different points of my work, and especially the following:

- Estimated cost of the canal;
- Estimated amount of traffic;
- Numerous different dates of inauguration;
- Consulting commission;
- Lock-canal;

Receipts and expenses:

Contractors (the Couvreux and Hersent contract);

Neutrality of the canal.

Ask, also, why the company has not published every month, the amount of excavations made since August 1887.

Demand furthermore, an exact specification, with full details, of the work which the company intends to perform to complete the canal.

If you are only given vague answers, hold private meetings to force the management to give you precise information, because, after giving six hundred millions, then a thousand millions, to make a tide-level canal, you cannot pay one thousand, six hundred and fifty-four millions for a lock-canal which will be impracticable.

The above translations from *Panama and Suez* will give additional light on M. de Lesseps impossible canal.

EXCAVATIONS.

SECTIONS.	UNDER WATER.			ABOVE WATER.		
	Earth.	Hard soil capable of being dredged.	Hard rocks.	Earth.	Rocks of mean hardness.	Hard rocks.
	Cubic metres.	Cubic metres.	Cubic metres.	Cubic metres.	Cubic metres.	Cubic metres.
Atlantic Section .	9,330,000	300,000	3,775,000	23,710,000	825,000	3,060,000
Culebra Section..	.....	.....	2,031,000	2,167,000	.....	23,199,000
Pacific Section...	2,675,000	.....	377,000	1,473,000	.....	1,475,000
Total	12,005,000	300,000	6,786,000	27,350,000	825,000	27,734,000

Grand total, 75,000,000 cubic metres,

GENERAL ESTIMATE OF COST.

First.—Excavations (sidings included).

(a) Excavations above water.

	Francs.
Earth, 27,350,000 c. m. at 2.50 francs.....	68,760,000
Rocks of mean hardness, 825,000 c. m. at 7.00 francs	5,775,000
Carried forward,.....	74,535,000

Brought forward.....	74,535,000
Hard rocks, 27,734,000 c. m. at 12.00 francs.....	332,808,000
Excavation of rocks, where pumping is necessary, 6,409,000 c. m. at 18.00 francs.....	115,362,000
(b) Dredging and excavations under water.	
Mud and alluvial soil, 12,005,000 c. m. at 2.50 francs	30,500,000
Hard soil capable of being dredged 300,000 c. m. at 12.00 francs.....	3,600,000
Excavation of rocks under water, 377,000 c. m. at 35.00 francs.....	13,195,000
	<hr/> 570,000,000
Second.—Dam of Gamboa; length 1,600 metres, maximum height 40 metres.....	100,000,000
Third.—Channels for the regulated flow of the Chagres, and for the Obispo and Trinidad riv- ers	75,000,000
Fourth.—Tide lock on the Pacific side.....	12,000,000
Fifth.—Breakwater in the Bay of Limon	10,000,000
	<hr/> 767,000,000
Sixth.—Add for contingencies(10 p. c.).....	76,000,000
	<hr/> 843,000,000
Total.....	<hr/> 843,000,000
Or at five francs to the dollar.....	\$168,600,000

